for Economical Transportation

CHEVROLET

INSTRUCTIONS

FOR THE OPERATION
AND CARE OF

CHEVROLET MOTOR CARS

NATIONAL
SERIES A B

MARCH 1, 1928
THIRD EDITION

CHEVROLET MOTOR CO.
Division of General Motors Corporation
DETROIT, MICHIGAN

PRINTED IN U. S. A.

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DIRECTIONS FOR ORDERING PARTS

Always order parts for your Chevrolet car from an Authorized Chevrolet Dealer or Service station so as to avoid the possibility of having inferior or substitute parts sold to you. Our warranty is void if such parts are used.

When ordering parts be sure to give the car number for which parts are desired. See Page 6 for location of serial number.

If in doubt as to the name of the part needed, send the broken part to your dealer or the factory branch or affiliated Company nearest to you listed below, attention of Parts and Service Department by PREPAID EXPRESS. Write your name and address plainly on the package so that it can be identified upon arrival. Write a letter the same day shipment goes forward, stating the purpose for which it is returned, REGARDLESS OF ANY PREVIOUS CORRESPONDENCE.

Order from factory or branch, attention of Parts and Service Department. If possible send cash with order because we cannot open accounts except with our regularly appointed dealers, who maintain a deposit sufficient to cover their accounts. ORDERS NOT ACCOMPANIED BY CASH WILL BE SENT C. O. D.

In ordering parts by telegram, be sure the message is PREPAID. COLLECT MESSAGES WILL NOT BE ACCEPTED by this company. Always confirm the telegram by a regular order, marked "confirmation of telegram," through the mail.

All Chevrolet dealers carry a stock of such parts as are needed most frequently; therefore, delays can be avoided by ordering from your nearest dealer or from the Factory, Branch or affiliated company listed below which is nearest to you.

FACTORIES AND BRANCHES

FACTORIES

Flint, Mich.		Tarrytown, N. Y.
St. Louis, Mo.		Oakland, Cal.
Norwood, Ohio	Janesville, Wis.	Buffalo, N. Y.

BRANCHES

Minneapolis, Minn.		Atlanta, Ga.
Dallas, Texas	Boston, Mass.	Pittsburgh, Pa.
Oklahoma City, Okla.	Memphis, Tenn.	Portland, Ore.
Denver, Colo.	Kansas City, Mo.	Baltimore, Md.
Jacksonville, Fla.	Des Moines, Ia.	Charlotte, N. C.

Important Notice. SEND PARTS ORDERS to Factory or Branch. Wholesale Offices do not carry a Parts Stock. See Map on Page 5.

WHOLESALE OFFICES

Chicago, Ill.	Charleston, W. Va.	Louisville, Ky.
Philadelphia, Pa.	El Paso, Texas	Omaha, Nebr.
Los Angeles, Cal.	Butte, Mont.	New York City, N. Y.
New Orleans, La.	Detroit, Mich.	Birmingham, Ala.
Houston, Tex.	Cleveland, Ohio	Salt Lake City, Utah
Columbia, S. C.	Fargo, N. D.	Wichita, Kan.
Richmond, Va.	Little Rock, Ark.	Seattle, Wash.
	Indianapolis, Ind.	Portland, Me.

STANDARD WARRANTY

Approved as to Form by National Automobile Chamber of Commerce, Inc.

We warrant each new motor vehicle manufactured by us to be free from defects in material and workmanship under normal use and service, our obligation under this warranty being limited to making good at our factory any part or parts thereof which shall within ninety (90) days after delivery of such vehicle to the original purchaser be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our vehicles.

We do not make any guarantee against, and we assume no responsibility for, any defect in metal or other material that cannot be discovered by ordinary factory inspection, or in any part, device or trade accessory.

This warranty shall not apply to any vehicle which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability, nor which has been subjected to misuse, negligence or accident.

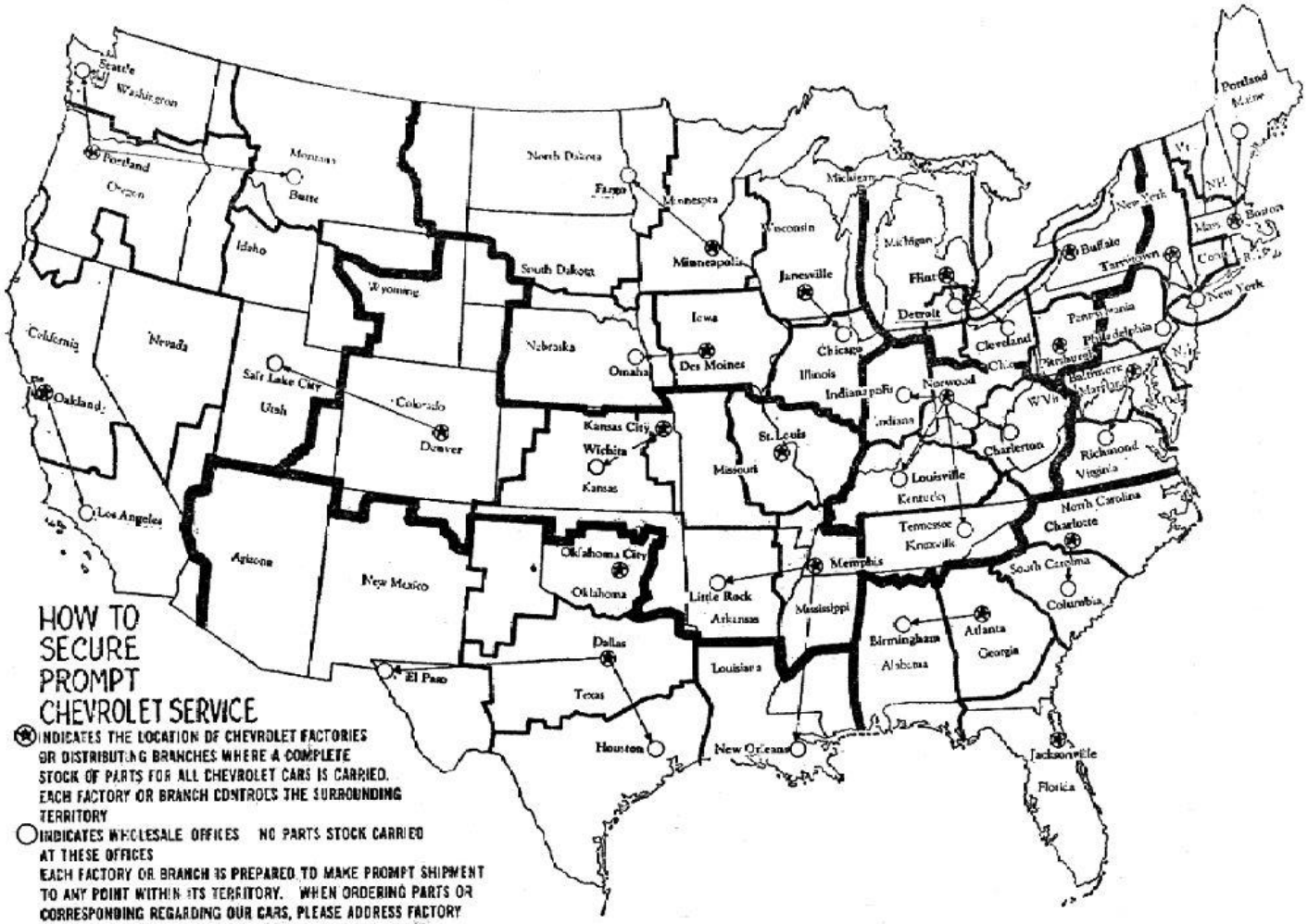
We make no warranty whatever in respect to tires, batteries, speedometers or other trade accessories, inasmuch as they are usually warranted separately by their respective manufacturers.

CHEVROLET MOTOR COMPANY.

IMPORTANT NOTICE

Do not take a chance of having a serious wreck by using inferior replacement parts. Protect yourself by using Genuine Chevrolet parts.

It is understood and agreed that our Standard Warranty is null and void on any Chevrolet Model where parts not made or sold by us are used in any replacements or otherwise.



HOW TO SECURE PROMPT CHEVROLET SERVICE

⊛ INDICATES THE LOCATION OF CHEVROLET FACTORIES OR DISTRIBUTING BRANCHES WHERE A COMPLETE STOCK OF PARTS FOR ALL CHEVROLET CARS IS CARRIED. EACH FACTORY OR BRANCH CONTROLS THE SURROUNDING TERRITORY

○ INDICATES WHOLESALE OFFICES NO PARTS STOCK CARRIED AT THESE OFFICES

EACH FACTORY OR BRANCH IS PREPARED TO MAKE PROMPT SHIPMENT TO ANY POINT WITHIN ITS TERRITORY. WHEN ORDERING PARTS OR CORRESPONDING REGARDING OUR CARS, PLEASE ADDRESS FACTORY OR BRANCH CONTROLLING TERRITORY IN WHICH YOU RESIDE.

MISCELLANEOUS DATA

The following information may be useful in securing license and insurance.

Serial Number:—

The serial number on the National models will be found stamped on a small metal plate located on the right front seat frame, visible when the door is open on the touring, roadster, landau, sedan and coupe. On the coach it will be found on the right sill under the carpet. On the touring chassis, one-half ton chassis and One Ton Truck, it will be found on the dash.

Motor Number:—

The Motor Number is stamped on a boss on right side of the cylinder block just back of the distributor.

Wheel Base:—

The wheel base is 107 inches.

Tread:—

The tread is standard, 56 inches.

Wheels and Tires:—

All cars are equipped with 30 x 4.50 straight side balloon tires. The One Ton truck uses 30 x 5 straight side Cord tires on the rear and 30 x 4.50 straight side Balloon on the front. Optional equipment on Truck is 30 x 5 front and 32 x 6 rear.

Engine:—

Number of cylinders, 4; bore, $3\frac{11}{16}$"; stroke, 4"; horsepower (N. A. C. C. formula), 21.7.

Shipping weight of National cars without gas, water or extra equipment: Touring car, 2110 lbs.; Roadster, 2035 lbs.; Imperial Landau, 2405 lbs.; Sedan, 2435 lbs.; Coupe, 2235 lbs.; Coach, 2360 lbs.; Cabriolet, 2270 lbs.; Half Ton Chassis, 1695 lbs.; One Ton Truck Chassis, 30 x 5 tires, front and rear, Four Fenders, Spare Rim, Less Cab, 2060 lbs.; One Ton Truck Chassis, 30 x 5 tires, Fenders, Cab and Spare Rim, 2430 lbs.; One Ton Truck Chassis 30 x 5 Tires, Stake Body, Cab and Rim, 3045 lbs.; One Ton Truck Chassis 30 x 5 Tires, Panel Body and Spare Rim, 2850 lbs.

Note:—These weights are compiled from all available statistics and are average weights from all plants, on which there is an allowable variation of fifty pounds.

Note:—Chevrolet dealers have factory trained mechanics. When repairs are necessary the best service may be had by patronizing Chevrolet dealers or Authorized Chevrolet Service stations. Insist on having genuine Chevrolet parts installed

TO THE CAR OWNER

You are to be congratulated on the selection of a Chevrolet Car for your personal use. We welcome you as a member of the Chevrolet Family and shall always be interested in your welfare. With this end in view we have established Chevrolet dealers and Service stations throughout the Country where genuine Chevrolet parts may be had when needed and the installation of such parts made properly at a low cost.

The degree of success encountered in the use of any automobile, regardless of price or kind, is a direct result of and in direct proportion to, the thought and effort expended in caring for that automobile. It, therefore, rests with the car owner to do the things recommended, or to see that they are done.

Avoid the use of substitute or inferior replacement parts. Genuine Chevrolet parts are handled through authorized dealers and service stations. Owners, therefore, who patronize other than authorized service stations will be liable to have counterfeit parts used for replacement. We have found that almost without exception counterfeit parts are of inferior quality and if installed, will not give the service that the genuine Chevrolet parts will give.

Like any piece of machinery, the automobile requires certain care along certain well defined lines at certain intervals. Given this care a maximum return on your investment in economical transportation may be expected at the minimum cost per mile.

The manufacturer has done his part, the dealer has shared this responsibility by seeing to it that the car is delivered to the owner in first class condition and has established an efficient maintenance department under the direction and supervision of experts. Always patronize Authorized Chevrolet Service stations and avoid the possibility of receiving inferior work or substitute parts.

Get the habit of making careful and periodic inspections. Keep all parts of the car clean and well lubricated (See Fig. 14 for Oil and Grease specifications) and drive with consideration for the car as well as for its occupants.

If necessary to write your dealer or the Chevrolet Motor Company for information on any subject, be sure in every case to give the serial and motor number. (See Page 6.)

WHAT TO DO UPON RECEIVING THE CAR

Before Chevrolet cars are shipped from the factory they are given a final examination during which every precaution is taken to have each and every item in accordance with specifications.

In spite of these efforts, however, many things may happen to a car or its equipment in transporting it to destination. It is necessary, therefore, that the buyer safeguard his own interests on receiving the car by observing certain precautions.

The buyer should insist on going over the car personally with the dealer's representative before the car is driven. Even though you have driven other cars you should insist on being instructed thoroughly in the operation of your new Chevrolet.

The treatment the car receives the first 1000 miles of use often determines the difference between a satisfactory car and one that is not.

First see that all tools, curtains and equipment are with the car. See that the serial number and motor number correspond to the numbers on your bill of sale. This is important.

Make sure that the radiator is filled with clean water.

See that there is a supply of good clean fuel in the fuel tank.

See that the oil reservoir is filled to the proper level with good clean fresh oil. (See Fig. 1) To read the gauge stop the motor, pull up the oil gauge rod located just below the oil filler tube. Wipe the oil off the rod. Insert the rod and remove it again. In this manner a true reading may be obtained. If the oil gauge rod shows the oil level to be below the full mark, remove the filler pipe cap and pour in a good grade of oil until the full mark is reached. (See Page 33 for specifications.) Replace the oil filler tube cap.

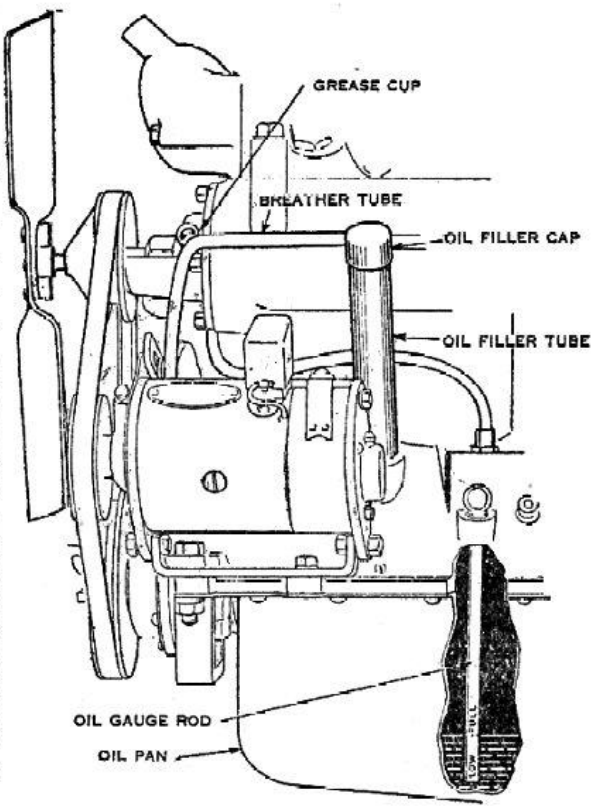


Fig. 1—Oil gauge and filler pipe.

The breather tube pipe in the National motor connects the crankcase to the carburetor, and the oil filler tube cap has a solid (not perforated) top. DO NOT PLACE A PERFORATED CAP ON THE OIL FILLER TUBE OF A NATIONAL MOTOR.

Do not put more oil into the oil reservoir than is required to bring the level up to the full mark on the oil gauge rod as the proper level is predetermined to give the best results and over-filling will simply mean increased wasteful consumption, smoking and carbonization.

WHEN TO CHANGE OIL

When necessary, all oil in the oil reservoir should be drained off and a fresh supply poured in. The old oil may be drained by removing the drain plug in the bottom of the oil reservoir. After the reservoir is completely drained, replace the plug and fill to the proper level with good oil. (See Fig. 1). Always use the best oil as it is the most economical in the long run. See Page 33 General Lubrication.

TIRE PRESSURE

Examine the tires to see that they are not damaged or under inflated. The air pressure for Truck 30" x 5" S. S. Cord tires should be about 70 lbs. in front tires and 80 lbs. in the rear tires. If "balloon" tires, that is the 30 x 4.50 are used, both front and rear tires should carry a pressure of at least 35 pounds.

This is very important for the reason that if the deflection is too great, that is if the tires flatten out too much under load, due to under inflation, trouble is sure to follow.

A drop of even two or three pounds in pressure quickly affects tread wear. The edges of the tread are subjected to a scuffing or wiping action which rapidly ruins the tread.

To secure best results from balloon tires they must be inflated to the above pressures and should be tested frequently to insure that the pressure does not drop more than three pounds before they are again inflated.

A red line is vulcanized into the tire casing used on all passenger cars, visible around the bead and side wall, to insure the tire being properly installed on the wheel. The red line should always be assembled so that it is at the valve stem. The tire, assembled on the wheel in this manner, insures perfect balance. If the tire is assembled with the red line in any other position, the wheel will be out of balance, and this condition will cause front wheel shimmey.

INSPECT WIRES AND ELECTRICAL CONNECTIONS

Raise the hood and examine all wiring, making sure there are no loose terminals. (See Page 63). Especial care should be taken to see that the terminals are tight and not corroded or covered with dirt or oil at the following places:

1. All connections to spark plugs.
2. All connections to the coil.
3. All connections to the generator and circuit breaker.
4. That the starting motor cable is securely fastened at the starting motor terminal post and also at the starter switch.

Next examine all connections on the dash and remove the floor board making sure that the positive cable from the battery to starting switch is fastened securely at both the switch and battery terminal ends. Be sure the negative or short cable is securely

clamped to the battery terminal and has a good solid clean electrical contact where fastened to the frame of the car. Be sure there is no paint, dirt or rust between the end of the cable and its contact with the frame.

INSPECT BATTERY

Remove the vent plugs in the battery and make sure that there is sufficient electrolyte to cover the plates to the proper height. (See Page 59 Care of Battery.)

The electric lighting, starting and ignition systems will perform their functions indefinitely and give you the maximum service if given even a reasonable amount of attention. (See Page 59).

INSPECT LUBRICATION

Next refer to Lubrication Chart, (Fig. 14) and make sure that all places requiring grease or oil have had the proper attention. Do not overlook the fact that a new car should have closer attention, and especially during the first 1000 miles of use, to the oiling and greasing than is really necessary after that period.

BEFORE STARTING THE MOTOR

Before you start the motor—in fact, before you should start the motor at any time—make certain of three things.

First, that the gear shifting lever is in neutral position, that is, it should be free to move from right to left. (See Fig. 4). DO NOT DISENGAGE THE CLUTCH.

Second, that the spark and throttle levers are in the proper positions for starting. (Fig. 2). Do not try to start the motor with throttle lever in closed position.

Be absolutely sure that the spark lever is properly retarded, as shown. (Fig. 2). Failure to observe this may cause serious damage

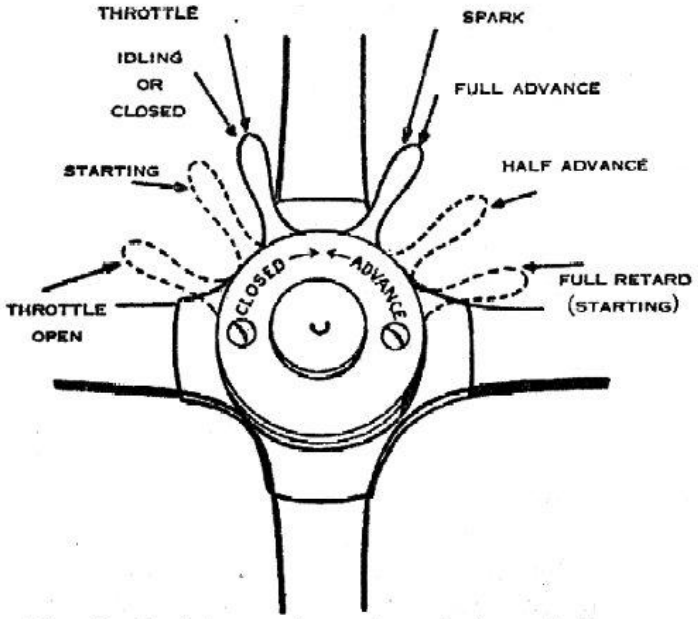


Fig. 2—Positions of spark and throttle levers

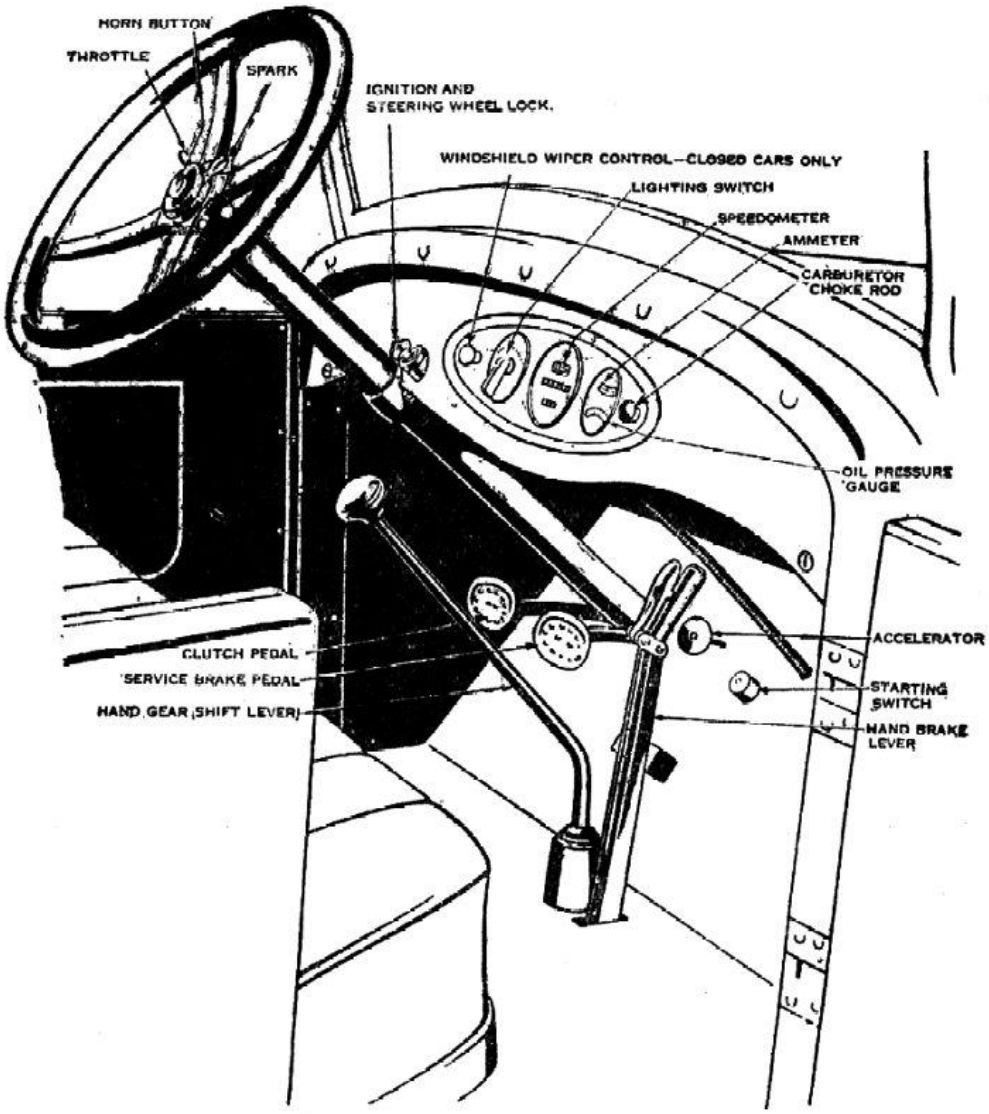


Fig. 3—Instrument Board

to the starting equipment or break the teeth from the fly wheel and subject you to unnecessary trouble and expense. **We will not be responsible for such damage, therefore, observe this point without fail.**

Third, that the ignition switch is turned on. (Fig. 3). To do so, insert key, then turn to right, until it can be withdrawn from the lock, this unlocks the steering column. The ignition may then be turned on by the switch lever behind the instrument panel. (Page 16).

After being absolutely sure that all THREE RULES given above have been carefully observed, start the motor.

TO START MOTOR

Located on the floor boards (Fig. 3) within reach of the right foot is the starting switch. With ignition turned on press down

the starter switch button as far as it will go and hold it until the motor starts. **Remove your foot the moment the motor starts.** DO NOT DEPRESS THE STARTER SWITCH BUTTON THE SECOND TIME, UNTIL THE MOTOR HAS COME TO A COMPLETE REST. Serious damage can be done to the starting motor or flywheel unless this is watched very carefully.

If the engine fails to start never hold the starter switch button down for any length of time without stopping to examine the position of the levers, switch, etc., as failure to start is generally an indication that something is wrong and a prompt investigation should be made.

Do not try to start the motor with the throttle in closed position.

CARBURETOR CHOKE ADJUSTMENT

Owing to the difference in specific gravity of gasoline obtainable in various localities, and also to difference in atmospheric conditions, it is sometimes necessary to feed the motor a fuel mixture rich in gasoline and poor in air when starting. This is particularly true in cold weather when the motor has become thoroughly chilled. This is done conveniently by means of the carburetor choke rod located on the instrument board (Fig. 3). In very cold weather it may be necessary to pull this rod all the way out for a moment only. As the motor starts, the rod may be pushed part way inward again until, when the motor is running smoothly and begins to warm up to the temperature of best efficiency, the rod should again be returned to its original position. The carburetor, before leaving the factory, has been adjusted so that the motor will run at its highest efficiency with the least gasoline consumption, therefore always see that as soon as the motor warms up to the proper temperature the rod is returned to its original position as quickly as possible.

A mixture which is "rich" in gasoline may heat up the motor or cause it to "gallop" or "miss fire" or cause lubrication troubles, with the consequent danger of "scoring," and rapid wear on all moving parts, besides being wasteful of fuel. **Avoid excessive use of the choke.** (See page 35, Crankcase Dilution).

CONTROL OF MOTOR SPEEDS

It is not a good thing to let the motor "race" idle (run at considerable speed without load). Therefore, you should now "retard" the THROTTLE LEVER, (Fig. 2) thereby cutting down the gas supply. AT THE SAME TIME ADVANCE THE SPARK LEVER until both have the position indicated in Fig. 2.

It is best to retard the throttle lever until the motor turns very slowly and just fast enough to maintain its operation.

For the novice it is well to try the motor-controlling devices with the car standing still advancing and retarding the spark, opening and closing the throttle. In this way a fair idea may be gained of the effect of these controlling devices on the action of the motor.

When the car is being operated at a speed greater than fifteen (15) miles an hour, the spark lever should be advanced to the fullest extent. By operating the spark in the retarded position, when the car is traveling along at high speed, the motor runs hot as the late explosion develops considerably more heat.

SPARK KNOCK

When the motor is laboring in sandy roads or on a hill at low speed, the spark lever should be retarded just enough to prevent the motor from having an ignition or spark knock.

ACCELERATOR

The accelerator pedal is located to the right of the service brake pedal. Pressing down upon this pedal causes the motor to be speeded up or "accelerated." When pressure is released a spring returns it to its normal position. The hand throttle lever and the accelerator pedal are interconnected. Advancing or retarding the hand throttle lever will move the accelerator pedal down or up, but pressing the accelerator pedal down will not actuate the hand throttle lever. It is possible, therefore, to set the hand throttle lever for any desired minimum speed so that when pressure is removed from the accelerator pedal the motor will not stop, but will drop to the minimum speed which you have selected.

The hand throttle is used in starting the motor and in touring as an occasional relief to rest the foot at times when the car is run considerable distances without material changes in its speed.

PUTTING THE CAR IN MOTION

When you are seated behind the steering wheel in the car, you have at your right hand a vertical lever moving in a ball and socket called the GEAR SHIFTING LEVER (Fig. 3). This lever controls the various speeds of the car.

If you are going to set the car in motion on the first or low speed:

First, ADVANCE THE SPARK AND THROTTLE LEVERS to the position indicated in Fig. 2. The motor speed will be increased.

Second, PUSH DOWN ON THE CLUTCH PEDAL, the one under your left foot (Fig. 3).

Third, move the gear shifting lever from the neutral position into first or low-speed position by moving it first to the left as far as it will go, and then backwards as shown in Fig. 4.

In moving the gear-shifting lever be sure to avoid the left-hand front or reverse position.

While you have been moving the gear-shifting lever you should keep the clutch pedal pressed down with the left foot.

Now let it come up, not suddenly, but gradually and smoothly, little by little, until the car moves slowly ahead. A little practice will soon show the proper clutch manipulation.

Remember, letting the clutch in suddenly is not only unpleasant to the occupants of the car, but VERY INJURIOUS to the entire mechanism, sooner or later causing serious damage.

Since you are in first or low speed your motor will run comparatively fast, but your car will travel slowly.

Be in no hurry to change into a higher speed, but let the car gain some momentum. If you are a novice run along slowly for some distance on the first speed to get the "feel" and to gain the confidence of handling.

After the car has gained sufficient momentum, prepare for changing to second speed.

Speed the car up just a little by opening the throttle.

Release the clutch by depressing the clutch pedal, the one under your LEFT foot, and while the car retains its slightly increased speed, and while you KEEP THE CLUTCH RELEASED, move the gear-shifting lever forward to neutral, thence to the right and right-front or second speed position. (Fig. 4).

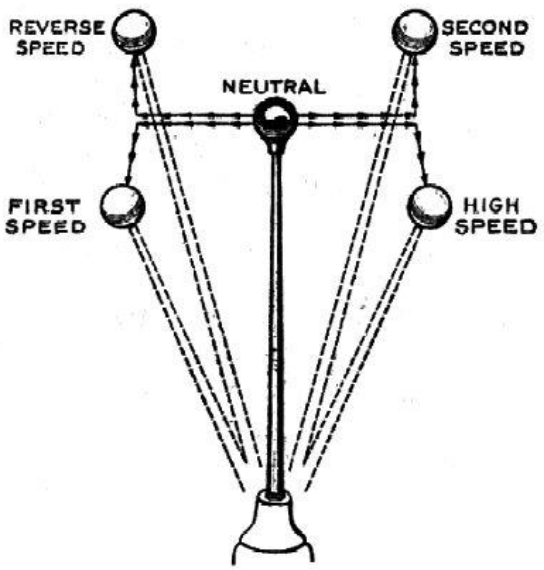


Fig. 4—Gear shifting Lever positions.

Now, let the clutch pedal come back easily as before, and at the same time advance the spark and throttle levers slightly.

Allow the car to gain some speed, then prepare for changing to high or third speed.

Release the clutch as before and, while the clutch pedal is depressed, pull the gear-shifting lever straight back into the right-rear or high speed position as indicated in Fig. 4. At the same time advance both the spark and throttle levers a little.

When you have become accustomed to changing gears, try using the accelerator pedal to "accelerate" the motor after making

shifts from second to high or high to second, instead of the throttle lever. You will find it less awkward, besides giving greater freedom of the hands.

It is possible to move the gear shifting lever from any one position to another, only be careful:

To keep the clutch released while moving the gear shifting lever.

To avoid the left front or reverse position while the car is moving. Under no circumstances should you attempt to shift to the reverse position until the car has come to a dead stop.

To avoid "clashing" when engaging the gears, pause a few seconds between the operations of depressing the clutch pedal and moving the hand gear shift lever.

When the gears clash press down a little more upon the clutch pedal and wait a moment before trying again. Remember, clashing the gears burns up the edges of the teeth, injuring them and, in time, making gear changes exceedingly hard, besides necessitating an early renewal of the gears.

Be deliberate: It is well to pause a moment after disengaging the gears before moving into the next speed. The fundamental requirements in every case are that the gears to be meshed shall be revolving at as nearly the same speed as possible. By waiting a moment, time is given for this to take place.

In changing to a higher gear, slow down the motor while the gears are disengaged. When changing to a lower speed, speed up the motor while the gears are disengaged.

STOPPING THE CAR

When you have decided that you want to make a stop, retard the throttle lever, or remove your foot from the accelerator pedal. Allow the car to coast for a moment or two on its own momentum, then gradually press downward on the service brake pedal, the one under your right foot, until the car practically stops, then release the clutch, by depressing the clutch pedal.

By applying the pressure on the brakes gradually, and by permitting the car to coast for a distance on its own momentum, you can gauge your stop to a nicety and come to a stop exactly at the desired spot.

You must keep the clutch pedal depressed while the car is coming to rest, and never under any circumstances, take pressure off the clutch pedal until after you have moved the gear shifting lever from the high speed position into the neutral position.

When the gear shifting lever is in neutral the transmission gears remain out of engagement, and although the pressure on the clutch pedal be now removed, the car will remain motionless although the motor continues to run.

PARKING THE CAR

If the stop is to be of some duration, always, before leaving the car, stop the motor, and lock the car with the key in the lock on the instrument board (Figure 3), then remove the key, also set the hand brake (Figure 3) by pulling the hand brake lever straight back towards you as far as it will go. Be sure that the pawl attached to the lever engages the tooth segment, otherwise the brake will not hold. To release the brake pull the lever towards you slightly. This causes the pawl to disengage more easily from the toothed segment then the lever can be pushed forward into its original position. Be sure the lever has been pushed forward as far as it will go when the car is moving, otherwise your brakes may partially "set," using up power besides wearing out the brake linings.

STEERING GEAR AND IGNITION LOCK

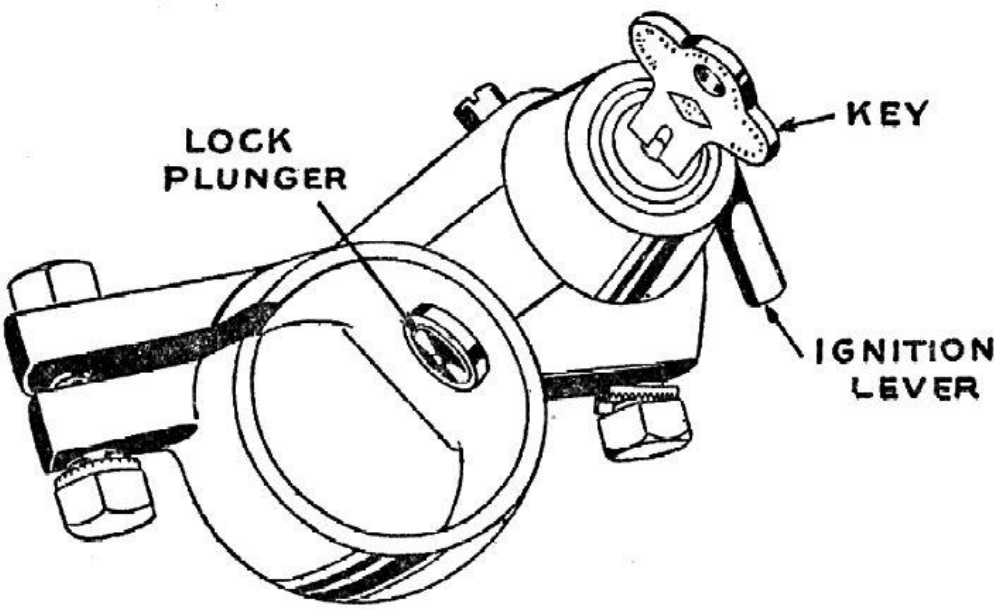


Fig. 5—Steering Gear and Ignition Lock

The Steering Gear Lock provides the safest, most convenient, and most reliable theft protection possible for your new car. The single operation of turning the key to the left, counterclockwise, locks the steering post. This moves the locking plunger into position to engage with the steel collar on the steering shaft **WHEN THE FRONT WHEELS ARE BROUGHT TO STRAIGHT FORWARD POSITION.** However, the lock may be closed regardless of the position of the front wheels.

TO LOCK THE CAR: First stop the car in the usual way. THEN SHUT OFF IGNITION BY MOVING LEVER BEHIND INSTRUMENT PANEL. Next turn the key in the lock (on the

instrument board immediately to the right of the steering column) to the left, (counterclockwise) until the key can be removed. NEVER TURN THE KEY WHILE THE CAR IS IN MOTION, AS BY SO DOING THE STEERING GEAR IS LOCKED WITH THE FRONT WHEELS IN THE STRAIGHT FORWARD POSITION, THUS LOSING CONTROL OF THE CAR.

TO UNLOCK THE CAR: Insert the key and turn to right, (clockwise) until it can be withdrawn from the lock. This unlocks the steering post. The ignition may now be turned on by the switch lever behind the instrument panel. The motor can then be started in the usual manner and the car is ready for driving.

The ignition is not on when the car is unlocked, unless it is turned on separately. The car cannot be locked with ignition on.

CAUTION: IMMEDIATELY UPON RECEIPT OF YOUR CAR, MAKE A RECORD OF THE NUMBER STAMPED ON YOUR KEY. THIS IS VERY IMPORTANT AS IT WILL BE VERY DIFFICULT TO REPLACE LOST KEYS WITHOUT THE NUMBER BEING KNOWN.

REVERSING OR BACKING THE CAR

Always bring your car to a "dead" stop before attempting to back up. Failure to observe this may result in serious damage to the transmission or rear axle and cause unnecessary expense. With the car at rest and the gear shifting lever in neutral, release the clutch by depressing the clutch pedal and move the gear shifting lever forward into the left forward position (Fig. 4). Now let the clutch pedal come back easily and at the same time accelerate the motor speed by opening the throttle slightly.

Remember that in moving backward the same movement of the steering wheel will cause you to turn to the right or left as it would were you going forward.

Proceed cautiously—more accidents occur when backing up than when going forward, as you cannot see clearly, so take your time, look around and make sure that you have your car under such control that a stop can be made instantly.

MAKING AN EMERGENCY STOP

There are times when the ability to bring the car quickly to a stop is of the greatest importance. When this occurs, release the clutch by pressing the pedal under your left foot and at the same time PRESS DOWN HARD on the service brake pedal, the one under your RIGHT foot. If this braking action is not sufficient to bring the car to a stop in the required time, "set" the hand brake by pulling the emergency brake lever (Fig. 3) towards you as far as it will go. By applying both the service and hand brakes you apply the braking effect on both inner and outer surfaces of the brake drum, which will have immediate results.

As soon as possible retard the throttle to prevent the motor "racing."

BRAKING EFFECTS

When the brakes are applied suddenly and with full force to the wheels of a car going at a considerable speed, the braking action will be so powerful as to immediately stop the rotation of the four wheels. But the car will not come to an immediate standstill, its momentum will carry it forward and the locked wheels will slide over the ground with most destructive effect on the tires.

The best method of using the brakes is that which applies pressure on them so gradually that the forward movement of the car and the rotation of the wheels come to a stop TOGETHER.

Avoid spectacular stops; they are not only unnecessary, but there may also come a time when the brakes will fail. The inevitable result will be a bad smash up with its consequent danger to others.

The careful driver shuts his power off before he reaches the stopping point, and permits the car to carry him along on its momentum, bringing it, with a gradual application of the brakes, to a halt at the exact spot.

Never apply the service brake without first closing the throttle if the car is moving at considerable speed as the braking effect would be destroyed, besides it is injurious to the mechanism. The motor can be used, however, in assisting to hold back the car when going down steep grades by leaving the clutch engaged and the transmission gears in first or second speed, as the resistance offered by the compression in the motor makes it unnecessary to apply brakes so hard that they might become overheated.

When operating the car in this manner, keep the throttle closed but do not turn off the ignition switch as a certain amount of unburned gas would accumulate in the exhaust pipe and muffler and there is danger of bursting the muffler when the ignition switch is again turned on.

STEERING

Steering is not a difficult task. Perfection comes from confidence, as well as from knowledge. Within a short time the novice will have learned just how much of a movement on the steering wheel is required to turn a corner, pass other vehicles or obstructions.

Turning the steering wheel to the left will cause the front wheels to turn in the same direction and the car will travel to the left. Turning the steering wheel to the right causes the car to travel to the right. This applies when backing up as well as when going forward.

A FEW HINTS ON DRIVING

Never drive your car at high speed over any road, much less a rough or slippery one. The slight gain in time saved will not offset the liability of an accident nor the pounding and racking to which the car is subjected. Usually the time saved is unimportant when figured in dollars and cents. The resulting repair bills, which in time are sure to follow, are never unimportant.

Economical transportation is not a question of how many miles are covered in a given time but the number of miles of useful travel that can be obtained at the least cost per mile for fuel, oil, tires and repairs.

RULES OF THE ROAD

Road and traffic laws vary in different localities. See Page 73— Adjustment of Headlights. It is, therefore, impossible to set down a complete list of rules which may be followed in all parts of the country. The following are some of the rules which are practically universal in all parts of the United States.

Immediately on the purchase of a car go to your local police or other authority and procure a copy of the traffic rules or regulations or ordinances as the case may be and study them carefully. **Traffic accidents don't happen, they are caused,** usually by ignorance, recklessness or neglect.

In meeting a vehicle going in an opposite direction PASS TO THE RIGHT.

In passing a vehicle going in the same direction PASS TO THE LEFT.

Always stop with the right side of the car next to the curb. If it is necessary to turn around to do this, it should be done.

Never turn around or turn off onto another road without making your intention to do so known to those following or be absolutely sure that there are no other vehicles close behind you.

Never enter upon street car tracks without making sure that no car is directly behind you—no matter how sure you feel, look and see.

Do not cross street car or steam railroad tracks without making sure that it is absolutely safe to do so.

In crowded traffic do not apply the brakes too suddenly. It may be that the vehicle following cannot stop as quickly as you can. If this is the case, a collision is sure to result.

On wet asphalt streets or slippery roads do not apply the brakes too suddenly. If the brakes are applied suddenly under these conditions a bad skid is sure to result.

When you intend stopping, or, in crowded traffic, slow up, ALWAYS make your intention known to the driver in your rear by an appropriate signal.

More rear-end collisions occur by neglecting to notify the driver following, that you intend stopping, or turning, than there are through carelessness on the part of the rear driver. Remember, the driver following cannot read your mind—all he can see is the

rear of your car and the roadway between—he cannot see the road ahead of you, and is therefore dependent on you to prevent a collision and damage to both cars. We recommend the use of a good "stop light"—as well as bumpers. These are no longer accessories but are necessities.

KEEP THE MOTOR CLEAN

Too much stress cannot be laid upon the necessity of keeping the motor clean. The dust drawn through the radiator openings as the car travels ahead contains grit, which, when wet with oil, forms a cutting compound that wears and scratches, leaving an irregular surface. This in time is sure to give trouble, so make it a rule to regularly clean all working parts. The slight inconvenience to yourself will be more than offset by the saving in repair bills later on.

SUMMARY

In order that you may get the maximum enjoyment and comfort out of your car, you must be as considerate and thoughtful about it as you would of a fine horse that is as fine and costly as your car.

Therefore:

Do not race the motor unnecessarily.

Be warned by every abnormal noise; if a squeak, locate it and lubricate the part. If it is some other noise, locate the parts that cause it and apply the proper remedy.

Don't tinker. Half the ability to make an adjustment or repair is the ability to discover its necessity.

Some motorists are said to have "luck" with their cars. There never seems to be any trouble, everything is trim and neat, the motor always starts when wanted and runs as long as is needed without any of the exasperating breakdowns on the road with which the unfortunate one thinks himself cursed through the carelessness of the manufacturer. With all adjustments carefully made when needed, every bearing and working part well lubricated, the whole car will work very satisfactorily and will continue to do so with only a very small fraction of the attention that would be absolutely necessary for the care of a horse.

By neglecting details you will save yourself some time and inconvenience in getting on your way; but the day of reckoning is sure to come. What you have saved may be spent in expensive roadside repairs.

DETECTING TROUBLE

Motor Will Not Start

If for any reason the motor does not start immediately under its own power, remove your foot from the starting button at once. One of the following things may be causing the trouble:

The ignition switch has not been turned on.

Gasoline supply exhausted.

Vacuum tank may be empty due to connections on top of tank or suction line to intake manifold becoming loosened or the shut-off cock under the vacuum tank may be closed.

Filter or screen in the carburetor may be clogged with sediment so gasoline cannot enter float chamber.

Gasoline line from vacuum tank to gasoline supply tank in rear may be broken loose at a joint or clogged with dirt, or if it is in cold weather an accumulation of water in the line from carburetor to vacuum tank may have frozen.

The carburetor choke rod may not be pulled out far enough, providing the motor is cold, to make the mixture rich enough to ignite, or the choke valve may have been closed too tight, causing the mixture to be so rich with gasoline that it will not ignite. (See instructions, Page 12 covering the operation of the choke rod).

The battery may be partially discharged and when the starting motor is in operation, not enough electric current is flowing to the coil to produce a spark sufficient to ignite the gas. Try cranking the engine by using the hand starting crank.

The coil may be burned out.

The contact points in the distributor may not be opening or the points may be burned so badly as to remain open.

The primary wire from coil to distributor, coil to switch or to battery, may be loose or broken, making poor contact.

Spark plugs may be fouled with oil or carbon.

Secondary wire from coil to distributor cover disconnected at coil.

WATER IN GASOLINE SYSTEM

If there is water in the gasoline, they will not mix, and water being heavier than gasoline will find its way to the lowest point in the system, namely, the carburetor. In cold weather, the water may freeze but by pouring hot water or applying hot cloths to the supply pipe and the carburetor it may be thawed. If water is poured on, be careful that none enters the carburetor, as water and gasoline will cause the motor to miss.

MOTOR MISSES AT HIGH SPEED ONLY

There is insufficient gasoline flowing to carburetor due to obstruction in gasoline line or filter screen.

A valve may be sticking slightly and does not come to its seat properly. Remove, regrind and polish stem.

There may be a loose electrical connection.

The spark plug points may not be spaced properly. About $\frac{1}{32}$ of an inch is the proper gap.

The springs on the contact arm in the distributor may be weak.

MOTOR MISSES AT ALL SPEEDS

Porcelain in the spark plug may be broken, allowing the spark to jump from the electrode in the center of the porcelain to the shell of the plug before entering the combustion chamber.

One or more spark plugs may be fouled. Thoroughly clean the sparking points and porcelain with cloth dipped in gasoline.

Compression may be poor due to pitted or warped valves.

A valve spring may be broken.

Push rods may be adjusted too tight.

Adjustment for the push rods may have become loosened and valve is not opening.

Filter screen in carburetor clogged and gasoline not flowing to carburetor properly.

One of the ignition wires may be loose and due to vibration makes and breaks the contact.

Contact points in distributor are not opening and closing properly.

Contact points may need cleaning or filing.

The carburetor may be flooding causing the mixture to be too rich. This is usually caused by the needle valve not seating properly. Consult the Chevrolet Dealer or service station. Repairs to the carburetor should not be attempted by the owner.

MOTOR MISSES AT LOW SPEED ONLY

Compression is weak due to leaky piston rings or valves not seating.

There may be a leaky gasket where the carburetor is attached to the intake manifold or where the manifold attaches to the cylinder head, permitting air to enter, weakening the mixture. To detect the leak, take an oil can filled with gasoline and squirt around where the connections are made. If any gasoline enters the opening, the speed of the motor will immediately increase thereby indicating a leak.

The carburetor adjusting screw which regulates the flow of gasoline at low speed only, may not be adjusted properly. Set the throttle for low speed running and turn the screw in or out to obtain the best low speed running adjustment.

The spark lever may be advanced too far. When running at low motor speeds the spark lever should be retarded.

When running at low motor speed the generator does not deliver electric current to the battery as the circuit breaker makes an "open" circuit in the line and ignition current is then supplied from the battery. If the battery is in a badly discharged condition it oftimes happens that insufficient current is being supplied for ignition purposes.

There may be one or more weak exhaust springs and with the throttle practically closed the vacuum created in the cylinders by the piston on the suction stroke will open the exhaust valve, drawing in burned gases and weakening the mixture so it will not burn. (See Page 26.)

MOTOR STOPS SUDDENLY

If the motor stops suddenly without any further explosions:

Examine all wires connecting the switch, battery, distributor and ignition for loose connections.

Test the wires at the distributor to determine whether electricity is getting through the ignition switch.

If it is found that the electrical connections are all tight and that there is electricity in the wires, examine the distributor, as the cam which operates the distributor may have become loosened and the contact points are not opening.

Examine gasoline supply.

Examine carburetor to see if gasoline is running into the float chamber.

Consult the Chevrolet dealer or authorized service station.

MOTOR SPITS AND BACKFIRES

This is usually an indication of carburetion faults although the backfiring through the exhaust pipe or muffler may be due to defective ignition. If for any reason the ignition apparatus fails to operate for a few revolutions of the motor, there is a considerable amount of unburned gas forced from the cylinders into the exhaust pipe and muffler, then when the gas is ignited in the cylinders the flame which is emitted through the exhaust valve ignites the gas in the muffler, causing an explosion.

Backfiring and spitting through the carburetor is often due to a weakened mixture, which is slow-burning, and as there is still a certain amount of flame in the cylinder when the intake valve opens to receive the new charge of gas, the result is that the gas in the intake pipe is ignited. The cause is usually a low gasoline supply or a clogged gasoline system, or there may be small air leaks in the intake manifold or at the connections which allow air to enter, making the mixture too lean.

Carbon which collects on top of the pistons and in the combustion chamber will sometimes become heated until it is incandescent and will ignite the incoming gas prematurely.

One of the intake valves may be sticking and not getting to its seat in time. It should be removed and the stem polished.

MOTOR LACKS POWER AND IS SLUGGISH

This is very apparent when ascending a slight grade or in attempting to accelerate the motor suddenly, and may be caused by the following:

First—Valves need grinding.

As the motive power is obtained by burning or exploding a highly compressed gas mixture, it follows that a certain amount of carbon will be deposited on the VALVE SEATS, PISTON HEAD and COMBUSTION CHAMBER. Small particles of carbon will lodge under a valve, especially the exhaust, holding it open. As this exposes the valve seat to the heat generated by the explosion, small pits or burnt spots will in time cause the surface to be so roughened as to prevent the proper seating of the valves. This will cause a leakage of gases, resulting in loss of power and uneven running of the motor. When this occurs, grinding the valves is the only remedy.

To determine which valves need attention, turn the motor over slowly by hand with starting crank and note whether the same degree of resistance is met with in each cylinder. The ones offering the least resistance are those whose valves leak. Grinding the valves is the only remedy.

Second—Worn or broken piston rings.

This is sometimes difficult to determine in advance, especially if the valves need grinding. Inasmuch as the cylinder head must be removed to make replacement of rings or pistons, it is advisable to examine carefully the valves before going further, should the rings or pistons be worn, they should be replaced.

Third—Valve push rods set up too tight, causing the valves to hold open. With the motor hot, test the valve clearance and adjust accordingly. (See Page 27)

Fourth—Late or sluggish ignition.

This is not a common occurrence and is best detected by an almost entire lack of power; also, the motor will heat readily causing the water in the radiator to boil. Check up the timing of the ignition.

Fifth—Badly burned spark plug electrodes, which increases the resistance of the plugs, resulting in a weak spark. Replacing the plug is the only remedy.

MOTOR GETS HOT

The following causes will usually lead to a hot motor:

First—Lack of proper oil or oil circulation stopped.

Second—Low water supply in the radiator. It is just as necessary to have a full tank of water as it is to have plenty of gasoline or oil. Make it a rule to regularly inspect and fill the radiator.

Third—Radiator water passages stopped with lime deposit. The radiator should be thoroughly flushed and cleaned.

Fourth—Fan belt too loose, or broken, causing fan to stop rotating.

Fifth—Late or retarded spark. This is usually apparent by a marked loss in power.

Sixth—Carburetor choke rod may be partially pulled out causing the mixture from the carburetor to be too rich. This point should be watched very closely and as soon as the motor gets warm after starting, the carburetor choke rod should be pushed forward as far as it will go.

Seventh—Examine brakes and see that they are not dragging. Sometimes the emergency brake lever is left partially set.

Eighth—The distributor may have become loosened, resulting in a retarded spark.

Ninth—The thermostat valve may be inoperative. See page 31.

MOTOR POUNDS OR KNOCKS

When a peculiar pound or knock, is heard, it should be investigated to determine as nearly as possible its location and seriousness.

Go about the task of locating the source of trouble carefully—don't jump at conclusions, and, above all, do not operate your car until you are satisfied that no harm will result pending later repairs.

Be sure that the motor has a plentiful supply of good oil (See Page 39) and that the oil is circulating properly.

Nearly all motor noises can be definitely located. Some, however, can only be approximated. These noises are usually the result of:

FIRST—AN ACCUMULATION OF CARBON DEPOSITS ON PISTON HEADS, VALVES AND IN COMBUSTION CHAMBER.

A motor which is badly carbonized will pound when the power is applied suddenly or when ascending a slight grade. Retarding the spark will reduce the noise; however, the motor will be sluggish, heat readily, and labor on the slightest pull.

Carbon will deposit in the combustion chamber of any internal combustion engine, so do not be alarmed. However, at the first opportunity the cylinder head should be taken off, the carbon removed, and the valves reground.

SECOND—LOOSE OR WORN BEARINGS.

A bearing knock or thump can be detected by accelerating the motor quickly, at which time a rattling and clashing sound will be produced, or, by starting the car with the brakes set, which will cause the motor to pull against resistance.

If it is found that the bearings have become loosened, they should be adjusted by a reliable mechanic.

Sometimes an ignition knock is mistaken for a loose bearing. Ignition knocks usually occur when the car is being operated on grades or in sandy roads with the spark fully advanced or when accelerating the motor after the car has been running at a low speed. By retarding the spark slightly, a knock or pound of this kind can be overcome. The spark should be advanced as soon as the car begins to reach its normal speed again and the going becomes easier.

Do not confuse body or chassis noises with motor knocks.

WEAK VALVE SPRINGS

As the valve springs are subjected to considerable heat, it follows that in time their "temper" will be affected.

By inserting a screw driver or other suitable tool between the coils of the exhaust valve spring (Fig 6) and turning it (while the motor is running) the tension of the spring can be increased. If the motor picks up and runs properly, replace the spring. If you have no new spring at hand, remove the old one and stretch it about an inch. As soon as possible, however, a new spring should be secured and installed to insure a permanent repair.

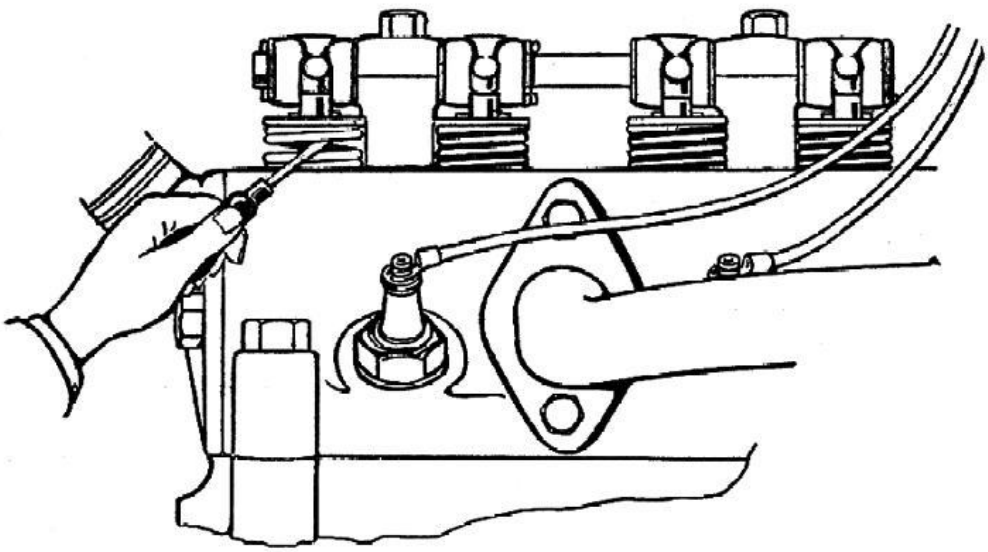


Fig. 6—Testing tension of valve springs.

ADJUSTING VALVES

To determine proper valve clearance, crank the motor by hand, turning the motor until the valve lifter has reached its lowest position.

The space between the rocker arm and the valve stem (Fig. 7) should be about .006 of an inch on the intake valves and about .008 of an inch on the exhaust valves when the valves are seated. The adjustment should be made when the motor is hot so that the

valve stems and push rods will be expanded to the limit. If the space is greater than this, loosen the lock nut on the rocker arm adjusting screw and turn the screw slightly with a screw driver

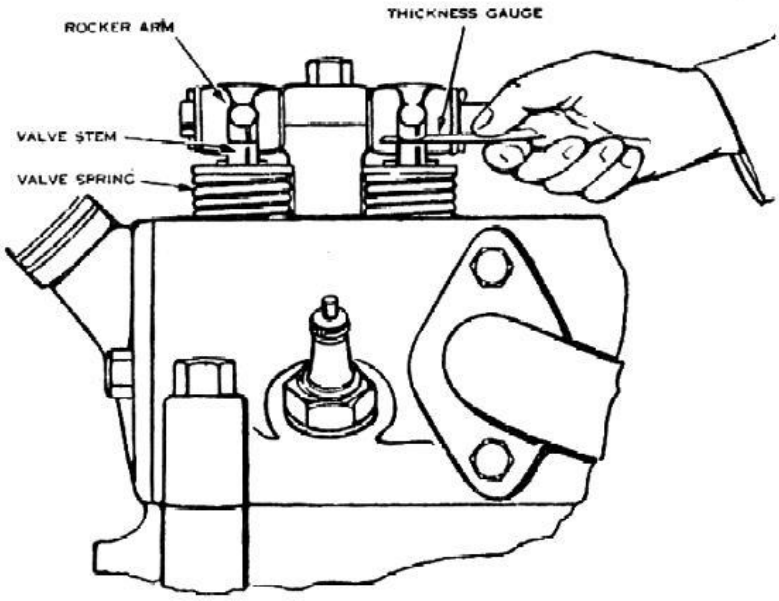


Fig. 7—Determining proper valve clearance

until the proper clearance is obtained, then tighten the lock nut so that the adjustment will not come loose. Check the clearance after lock nut is tightened to make sure adjustment is correct.

Caution: The necessity for valve adjustment will show itself first by excessive clicking of valve lifters, and second by poor running of motor. It is not necessary to make alterations under any other conditions.

DEFECTIVE IGNITION

First of all, ascertain whether the trouble is in the distributor the wiring, or the spark plugs. In most cases it will be found in the external wiring or plugs when one cylinder continually mis-fires.

To determine the location of the trouble, go about the task systematically—do not jump from one thing to another but satisfy yourself that each part examined is working in its proper position.

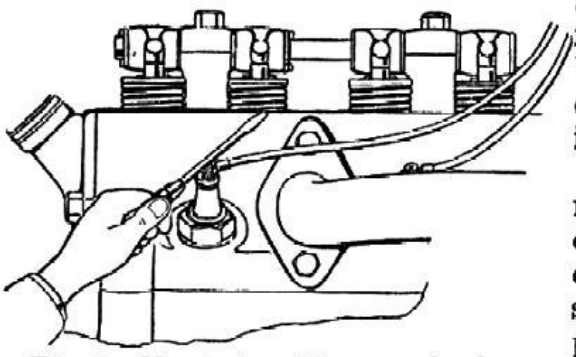


Fig. 8—Short circuiting spark plugs.

When the engine misfires regularly on one or more cylinders, it is probably caused by one or more dirty spark plugs. To locate the particular faulty plug, proceed as follows:—

1st—Operate the engine at idling speed with retarded spark.

2nd—Grasp a screw driver by its wooden handle, holding the metal end against the spark plug terminal and at the same time touch the cylinder head, thus short circuiting the plug, Fig. 8. Be careful to hold the screw driver by the wooden handle, or a shock will result. Short circuiting a spark plug which is not working will not change the motor speed. On the other hand, it will cause the motor to slow down or stop, if the short circuit is established with a working plug. After the dirty or fouled plugs have thus been located, they should be cleaned and adjusted or replaced by new ones.

Be sure that the new plugs are of the correct type and size, as supplied with the car. When plugs have been in use for approximately ten thousand miles, we recommend a complete new set.

SPARK PLUGS

The Spark Plugs in the Chevrolet engine have been designed and made expressly for this engine by the AC Spark Plug Company of Flint, Michigan.

SPARK GAP

Spark Plugs will not deliver their maximum spark unless the sparking points are properly spaced and the spark gap of these plugs should be set at .025, or less than 1/32 inch.

CLEANING CARBON FROM THE PORCELAIN

To clean carbon from the porcelain, proceed in the following manner: Fill the lower part of the plug with alcohol, or any liquid metal polish, and allow to stand for a few seconds; take a piece of wire covered with one thickness of cloth and rub the carbon from the porcelain so as not to affect the glaze—then wipe clean and dry thoroughly before replacing in the engine.

Spark plugs should be changed every 10,000 miles as they deteriorate. New Spark Plugs mean quick starting, increased power, smoother running motor and less use of choke, resulting in more economical operation of the car.

CLEANING POINTS

Cleaning the sparking points of AC Plugs should be done with emery cloth.

The correct AC Spark Plug for Chevrolet cars is AC, Type B, and can be had at all Chevrolet Service Stations.

If, after satisfying yourself that none of the things listed above is the cause of the trouble, find a cylinder that you know is working and put the assumed bad plug in that one and the good plug in the bad cylinder. If the trouble goes with the plug you are sure it is the plug; if not, look elsewhere.

SPARK PLUG WIRES

To determine if the spark-plug wire is at fault disconnect it from the spark plug and hold the end about one-quarter inch from

the plug. If no spark jumps across the gap with the motor running, examine the terminals and insulation. Sometimes the copper wires break but do not damage the insulation. If no exterior damage can be found replace the wire on the plug, and with motor running, slip the wire out of the socket on the distributor cap and hold it about one-quarter inch away from the brass ring on the socket. If no spark is obtained, remove the distributor cap and examine the terminal point protruding from the inside of the cap. If it is found burned or blackened on the point thoroughly clean and polish.

TESTING DISTRIBUTOR

If trouble is suspected with the distributor first see if electric current is being delivered to the distributor by the primary wire from the switch and battery. If the distributor is functioning properly, the primary current will pass through the breaker arm and contact points direct from the coil when the contact points are closed. To determine whether there is any trouble at this point, disconnect at the coil the primary wire which leads from the distributor to the coil, and with the contact points closed and with the ignition switch turned on, strike the terminal end of the wire against the terminal on the coil.

If there is a spark, the current is flowing properly. If no spark is obtained, make the following examination:

Examine the spring on the distributor arm. See that this is not broken and that it is making a good contact with the high tension terminal in the center of the distributor cap.

Examine the primary wire. See that the insulation is good and that it is properly fastened to the distributor.

Occasionally oil or grease will get into the distributor and form a connection between the case and the insulated contact point. Wipe out thoroughly.

There may be a "ground" in the distributor due to defective insulation between the supports of the contact points and the distributor housing.

Examine the contact points to see that they are clean, not burned or corroded and are opening and closing properly.

TESTING COIL

In order to determine if the coil is operating properly, secure a piece of wire, attach one end to the frame of car or motor casting or other metallic "ground," bring the other end to within three sixteenths inch from the point where the high tension wire (running from coil to the central terminal on the distributor) leads from the coil and crank the motor by hand with the switch on. If a spark occurs at this point the coil is operating properly.

If no spark occurs and the primary circuit from the battery to the coil is intact, it is evident that the coil should be replaced or repaired.

There are times, however, when it is possible to obtain a spark in a test of this kind when the coil will not operate properly at higher speeds. If ignition trouble occurs and it is impossible to locate the trouble at other points, the coil should be taken to a Chevrolet repair station where a test can be made of the coil when it is operating under practically the same conditions as it is in the car when the trouble occurs.

TEST OF PRIMARY CIRCUIT

When testing the primary circuit there are practically only two things to be taken into consideration, namely: the condition of the contact points in the distributor and the wiring.

STARTING MOTOR DOES NOT OPERATE

This is an infrequent source of difficulty but may be caused by any one of the following:

First—Exhausted battery due to excessive use of the starting motor or lights and is the direct result of failure on the part of the owner in not observing the rules set forth for the care of his battery. (See Page 59.)

Second—Broken or loose wires or connections either at the battery, starting switch or starting motor. Be absolutely sure that the connections at the battery, starting switch and starting motor are secure. Examine all connections and wires carefully. See that all connections including battery terminals are clean and tight. Inspect the cable leading from negative post of the battery to the frame and see that this is a clean, firm contact with the frame of the car. If there is dirt or paint at this point, scrape clean and fasten the cable solidly to the frame.

Third—Corroded battery terminals causing poor contact. Remove and thoroughly clean, then cover with vaseline or petroleum jelly.

Fourth—Starting switch making poor contact, having corroded contacts.

Fifth—Starting motor may be "short circuited" or may have shifted out of line.

Sixth—Starting motor brushes worn out or not making contact, or dirty or corroded commutator. (See Page 61 Care of Starting Motor).

COOLING SYSTEM

The radiator at all times should be kept full of clean water or trouble is sure to follow. It is a good plan to form the habit of inspecting and filling the radiator before the car is taken from the garage. On long tours, especially when you have been traveling over hilly roads or those with a loose top surface, examine the water supply quite frequently. Consider, always, that the proper amount of water is as important as your supply of gasoline and oil. It is well to examine the water supply every time a stop is made for oil or gasoline.

Always use clear water. If rain water can be had, use it, as less scale or deposit will result.

Once a month it is a good plan to open the radiator drain cock which is conveniently located on the right side at the bottom of the radiator, and let all the water and accumulated dirt run out. If the water is very dirty, flush the radiator with fresh water.

NEVER—AND BE SURE ABOUT THIS—PUT COLD WATER INTO THE RADIATOR WHILE THE MOTOR IS HOT OR OVERHEATED.

Leaks in any cooling system are likely to occur, so don't be alarmed if you find your radiator has "sprung" a leak. As soon as possible it should be soldered, as a leaky radiator is not only a source of some annoyance by reason of frequent refilling, but a seam, once

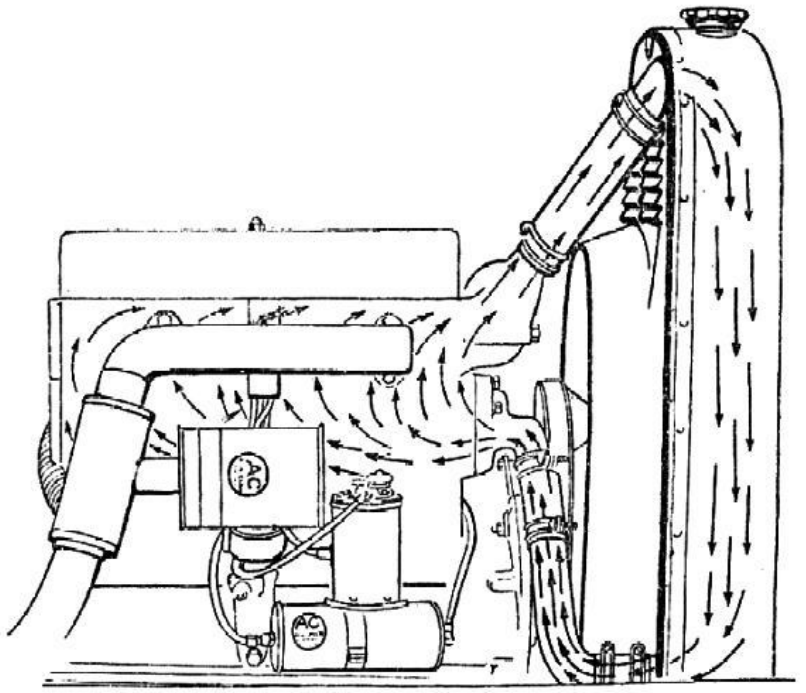


Fig. 9—Cooling system.

opened up, is likely to get larger, resulting in sudden loss of water with disastrous results.

It is not a good plan to put Anti-Leak Compounds, corn meal, bran, or other similar substances in a radiator to stop a leak. It fouls the tubes and decreases the efficiency of the radiator. Better by far make a permanent repair as soon as a leak is discovered.

The National motor is equipped with a thermostat inside the water outlet, which is mounted on the cylinder head. (See Fig. 10.) At low temperatures, the thermostat valve is closed and thus confines the water in the cylinder head until it has reached a higher temperature; then the expansion of the thermostatic unit opens the valve and complete water circulation is obtained.

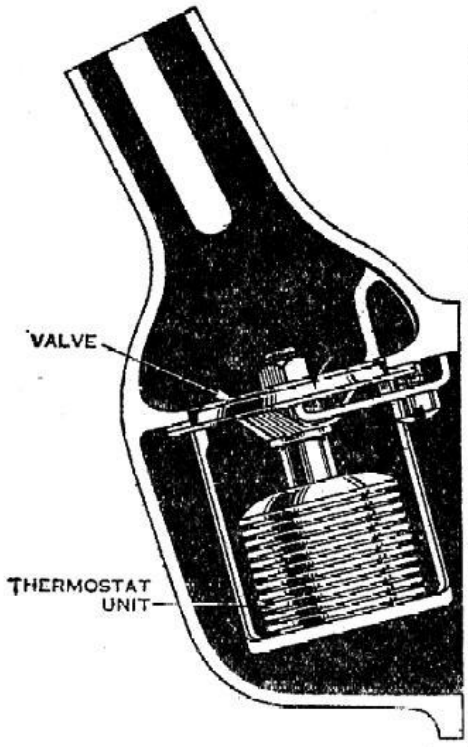


Fig. 10—Thermostat

The thermostat insures better cold weather motor performance. easier starting and lessens crankcase dilution, since the motor reaches the point of thermal efficiency sooner.

If the thermostat fails to operate the valve, the motor will, of course, get excessively hot and a new thermostatic unit should be installed.

WINTER DRIVING

In freezing weather the water in the cooling system should be replaced with a solution having a lower freezing temperature than water.

There are several types of cooling solutions which may be used, the most common one being denatured alcohol and water. This solution has been used for a great many years and is satisfactory. It has two general disadvantages: First, the alcohol itself, or vapors from the alcohol, affect the Duco finish. Second, the alcohol is likely to evaporate out on heavy runs, and if not carefully watched, the motor, or radiator, or both, are likely to be damaged by freezing.

Other types of freezing solutions can be made of either distilled glycerine and water, or Prestone (Ethylene Glycol) and water. These solutions do not have the same disadvantages as alcohol: that is, they do not affect the Duco finish, and the loss by evaporation is water, which must be replaced. However, if air is drawn in through a leaky pump packing it will cause these solutions to foam, and the air may react with the material so as to cause serious difficulties. If these solutions are used, the instructions of the maker should be carefully followed.

All cooling solutions, even water, will cause a formation of some deposit in the radiator, such as rust, lime, etc., which must be flushed out from time to time. Both alcohol and glycerine tend to loosen up these deposits and therefore it is very important to thoroughly flush out your cooling system, before adding the anti-freeze.

The question of cost is a very important one and this will have to be settled by the user himself, but knowing the advantages and the disadvantages of each one, it remains for the user to pick the particular anti-freeze which will give him the best over-all results.

Anti-freeze solutions composed of salts dissolved in water, such as Calcium Chloride, Magnesium Chloride, etc., are not recommended.

It requires approximately eight and one-half (8½) quarts of water to fill the cooling system of a Chevrolet passenger car. The truck requires about 8 quarts.

The following tables give the percentages by volume, the temperatures at which the first ice crystals form and the specific gravity of solutions of denatured alcohol and water:

Percentage by Volume Denatured Alcohol 180° Proof	Parts by Volume Alcohol	Parts by Volume Water	Freezing Point	Sp. Gravity at 60°F.
20	1	4	19°F.	.978
25	1	3	15	.973
33⅓	1	2	6	.965
50	1	1	−18	.943

For use in determining the freezing point of alcohol-water solutions, hydrometers with double scales are on the market. One scale is to be used when the radiator liquid is hot; the other when it is cold. Instruments with only one scale, without a suitable correction chart, may lead to highly incorrect readings of the protection afforded, and damage to the car may result.

If the radiator should freeze, do not try to thaw it out by starting the motor but thaw it by placing in a warm garage.

If a strong solution of alcohol should accidentally come in contact with the Duco on your car, it should be flushed off immediately with cold water. Do not rub. Alcohol is one of the very few substances that will affect Duco.

ICE ON WINDSHIELD

If you are troubled with snow and ice sticking to the windshield, this condition may be remedied by rubbing a thin film of glycerine on the windshield glass.

GENERAL LUBRICATION

The chart on lubrication (Fig. 14) shows where and when to lubricate different units of a Chevrolet Car. The thing to bear uppermost in mind is that oil and grease are much cheaper than repair bills, and should be applied regularly if you are to secure a maximum of useful service from your car.

NOTE: This chart may be removed from the book and tacked on the garage wall for ready reference.

Don't wait until you hear a "squeak" before oiling. This means a rusted or dry bearing surface and when once in that condition trouble soon follows.

Lubrication is the most important and at the same time the most serious problem you as the owner of a motor car have to face. Correct lubrication is not insured by merely placing the proper quantity of oil or grease in your car. Find out from the dealer or manu-

facturer from whom you purchased the car the proper oil for your car and then always use it.

To assist in meeting this problem on lubrication, the Chevrolet Motor Company has the following recommendations to make with respect to oils:

We do not recommend the use of so-called re-refined oils, as we find that unless extreme care is used in the refining process, they are wholly unsuitable for use in Chevrolet cars.

For correct motor lubrication, a high grade, well refined oil is essential. All reputable oil companies issue lubricating charts, the use of which we recommend as a guide to the proper viscosity or body of oil for summer and winter use which, of course, varies in different localities.

In general, an oil having the body of S. A. E. viscosity No. 30 has been found best for summer use. S. A. E. viscosity No. 30 is also recommended for winter use, except where temperatures below 32° F. are continually encountered. For temperatures continually below 32° F. an oil with a low cold test is recommended.

CHANGE THE OIL IN CRANK CASE

Any two metal surfaces moving in contact, one with the other, no matter how well lubricated, will eventually wear. Minute metal fragments tear or break away and accumulate in the oil, thus adding minute abrasive particles to the oil. In the case of a motor car this is made still worse by the addition of road dust, small particles of carbon and foreign matter in the air finding their way into the cylinders and crank case. For this reason the oil in the crank case eventually becomes unfit for further use and must be drained off and replaced by fresh clean oil.

This should be done approximately every 3000 miles in summer and approximately every 500 miles in winter, but this too is largely governed by the mechanical condition of your car and how carefully you as the driver handle and care for it. Under severe conditions the oil should be drained from the crankcase oftener.

OIL FILTER

The function of the oil filter is to remove from the crankcase oil all particles of dirt, carbon and abrasive particles, thus reducing engine wear to a minimum and considerably reducing the frequency with which it is necessary to change lubricating oil.

The filter is connected so that a percentage of the oil flow passes through and returns to reservoir. When the filter is new its capacity is approximately ONE quart of oil per minute at a car speed of 25 miles per hour. This rate of flow will gradually decrease as the filter becomes clogged with the dirt and sludge removed from the oil and will eventually cease to function. This is at approximately 10,000 miles. **When this occurs it is important and necessary to replace the filter cartridge in order to prevent wear caused by dirty oil after the filter has ceased to function.**

When necessary to replace filter cartridge, disconnect inlet and outlet connections, loosen mounting brackets and replace old cartridge with new one.

A new filter cartridge or "refill" may be obtained from your Chevrolet Dealer, United Motors Service Branches or AC Service Stations.

TESTING OIL FILTER

To determine if oil is passing through filter, unscrew test cock and if oil flows the filter is operating.

CAUTION: When testing operation of filter, engine must be warmed up and running. Be sure that test cock is screwed back tightly after making this test and all connections are tight.

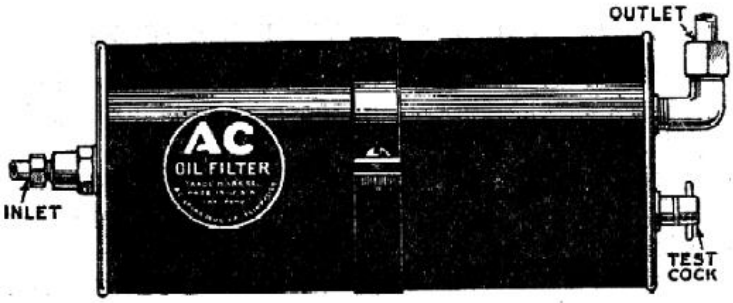


Fig. 11—Oil Filter.

CRANK CASE DILUTION

Another phase of motor oil deterioration, probably the most serious of all, is that of crank case dilution.

By crank case dilution we mean a thinning of the oil on account of certain portions of the gasoline or fuel leaking by the piston and rings and mixing with the oil. This condition will be encountered in all classes of cars and motors regardless of make or model. It is always present in a greater or less degree and must be combatted continually.

Careful attention to a few comparatively simple precautions will minimize it and avert real damage.

The cause of crank case dilution in most cases can be traced directly to the character of the fuels in use. Practically all motor fuels today contain portions which are slow burning and hard to ignite. The thinning of the motor oil is due to unburned fuel vapor which forces or works its way past the pistons and rings and in coming in contact with the cool walls in the crank case, condenses and is mixed with the oil, thus reducing the "body" of the oil and impairing its lubricating qualities.

All motor oils are subject to this dilution.

With a given percentage of fuel, heavy oils are reduced in body more rapidly than are lighter grades. Therefore, in a motor designed

to handle a light or medium oil, the use of a heavy oil will not retard the tendency to become thin, but may lead to other and more serious trouble.

USE OF CHOKE OR PRIMER

There are other causes such as the careless use of the choke. It is a well known fact that to start a cold motor a rich mixture is required until the motor is "warmed up." In order to hasten this "warming up," the tendency is to use an excessively rich mixture.

By the careless use of the choke it is possible to force several ounces of raw gasoline into the lubricating system in the first few minutes of running. This practice, if persisted in, is sure to spell, if not disaster, serious trouble in a short time. Use the choke sparingly.

MECHANICAL CAUSES OF DILUTION

Dilution may be caused by such faults mechanically as, scored cylinders, poor ring fit, "sloppy" or loose pistons, and faulty valves. The remedy is obvious.

Poor ignition due to any of the following conditions will also increase dilution: dead or fouled spark plugs, incorrect timing, faulty coil, distributor, weak spark, or leaky gaskets.

Common causes of incomplete combustion of the fuel are over-rich mixture caused by faulty carburetor adjustment, restricted air intake to carburetor, wrong jet or nozzle in carburetor, defective carburetor, or air leaks.

PRECAUTIONS TO PREVENT DILUTION

1. Avoid excessive use of choke.
2. Avoid idling or excessive slow driving in cold weather.
3. Keep motor in good mechanical condition. Valves properly ground and in perfect adjustment.
4. Drain oil frequently at least every 500 miles in winter and more often if you find the oil becomes very thin.
5. Frequently test condition of oil at oil filter test cock.
6. Use radiator cover in cold weather.

WATER IN CRANK CASE

Serious lubrication troubles may result in cold weather by an accumulation of water in the oil reservoir. This condition is as a rule little understood by the car owner. To demonstrate the chief cause of water in the oil reservoir, hold a piece of cold metal near the end of the exhaust pipe of the motor and note the rapid condensation and collection of drops of water on the cold metal. The exhaust gases are charged with water vapor and the moment these gases strike a cold surface will condense, forming drops of water.

On account of a certain amount of these gases passing the pistons and rings, even under the most favorable conditions, we will

have the formation of water in the oil reservoir in a greater or less degree until the motor becomes warm. When the motor becomes thoroughly warm, the crank case will no longer act as a condenser and nearly all of these gases will pass out through the breather. The thermostat helps to prevent condensation in the crankcase.

Short runs in cold weather, such as city-driving, will aggravate this condition but even under the best of conditions a small amount of water may always be expected in the oil reservoir.

No motor is entirely free from this tendency under certain severe conditions. It is not possible to entirely eliminate "sweating" or "condensation" in the oil reservoir. However, certain precautions can be taken to reduce the bad effects to a minimum.

The following precautions will have a tendency to greatly reduce motor and lubrication troubles:

(1) After the motor has been standing idle for a time and while still warm, drain off a small quantity of oil from the bottom of the oil reservoir and note whether or not it contains a few drops of water. If so, repeat this operation every few days and you will keep the oil reservoir practically free from water and remove the cause of much trouble and consequent repair bills.

(2) Select good fuel. High test gasoline generally gives the best results, and the additional satisfaction, ease of starting and freedom from annoyance more than offsets the slight additional cost.

TESTING FUEL

A very simple yet practical way of testing fuel to determine if it is suitable for your car is to put a tablespoon full of the fuel into a clean porcelain dish or cup; ignite it and allow it to burn until all the fuel has been consumed, being careful to protect it from air currents or drafts.

The amount and quality of the residue left on the bottom and sides of the porcelain dish are an indication of the quality of the fuel. If the bottom of the cup is practically clean, the sides free from soot, the fuel is good; if a heavy deposit of soot is left on the walls of the cup or a quantity of heavy oily or tarry substance on the bottom of the vessel, the fuel is of poor quality. Between these two results—a clean fuel and one that leaves a heavy residue—lies the quality ranging from good to bad.

ETHYL GASOLINE

Our experience with Ethyl gasoline over the last several years indicates that it is a satisfactory fuel for use Chevrolet cars.

CORROSION

Practically all present day motor fuel contains small amounts of sulphur which in the state in which it is found is harmless but this sulphur on burning forms certain gases, a small portion of which is likely to leak past the pistons and rings and re-acting with water when present in the crankcase form very corrosive acids. The more

sulphur in the fuel the greater the danger from this type of corrosion. This is a condition which we cannot wholly avoid, but it may be reduced to a minimum by proper care of the motor.

As long as the gases and the internal walls of the crankcase are hot enough to keep water vapor from condensing no harm will result, but when an engine is run in low temperatures, moisture will collect and unite with the gases formed by combustion, thus acid will be formed and is likely to cause serious etching or pitting. This etching, pitting or corrosion, when using fuel containing considerable sulphur manifests itself in excessively rapid wear on piston pins, camshaft bearings, and other moving parts of the motor, oftentimes causing the owner to blame the car manufacturer or the lubricating oil when in reality, the trouble may be traced back to the character of present day fuel or a condition of the motor resulting in excessive blow-bys or faulty carburetor adjustment.

It is possible to find this condition in a gas engine where superficial tests of the fuel and of the lubricating oil indicate no sulphur in either one and this is to be expected, since sulphur in the form in which it occurs in most present day automobile fuels is not corrosive or acid and does not become so until after being burned and the products of combustion have combined with water.

Certain precautions to reduce the liability of corrosion may be taken by the car owner.

(1) Use good fuel and cover for radiator in winter.

(2) Use none but the very best grades of oil.

(3) Drain the crankcase frequently and flush out with a light washing oil.
(Never use gasoline or kerosine to flush out the crankcase) Re-fill with a good grade of oil.

(4) Once each week in winter draw off a half-pint of oil from the crankcase at the drain plug after the motor has been in use, allowing time for the water, if any, in the crankcase to settle to the lowest point. You will likely find a small amount of water each time you drain.

(5) Use the choke sparingly.

(6) Do not idle the motor unnecessarily.

(7) Keep piston and ring fits up to standard, thus preventing blow-bys.

(8) Keep valves ground and properly adjusted.

(9) Be sure cylinder head gaskets and intake manifold gaskets do not leak.

(10) Take your car to the Chevrolet Dealer for regular periodic inspection.

(11) Test condition of oil filter by unscrewing test cock, and renew filter cartridge if necessary, (Figure 11).

Learn to know your car and its peculiarities—give it the proper care, use good oil and fuel, and the car will respond by giving you long and continuous service at a very low cost in repairs.

MOTOR LUBRICATION

The oil is carried in a reservoir located at the bottom of the crankcase and is filled through a filler tube on the left side of the motor just back of the fan. (See Page 8, Figure 1).

Fill the oil reservoir to the proper level with the best oil obtainable (See Page 33, General Lubrication) Good oil is cheaper than repair bills, therefore, observe this point regularly. Use cylinder oil to lubricate the rocker arms and push rod felts, keeping the felt saturated with oil. The Chevrolet Motor is a combination pump and splash system and none but the best grades of medium or light oil should be used as complete lubrication depends on the oil being thoroughly atomized so that the oil mist or vapor will reach all working parts of the motor.

OILING SYSTEM

In the Chevrolet oiling system the oil pump (Fig. 12) is placed inside the crankcase and lifts the oil from the oil reservoir to the oil distributor where the flow is divided and passes through pipes to the oil troughs located under each connecting rod.

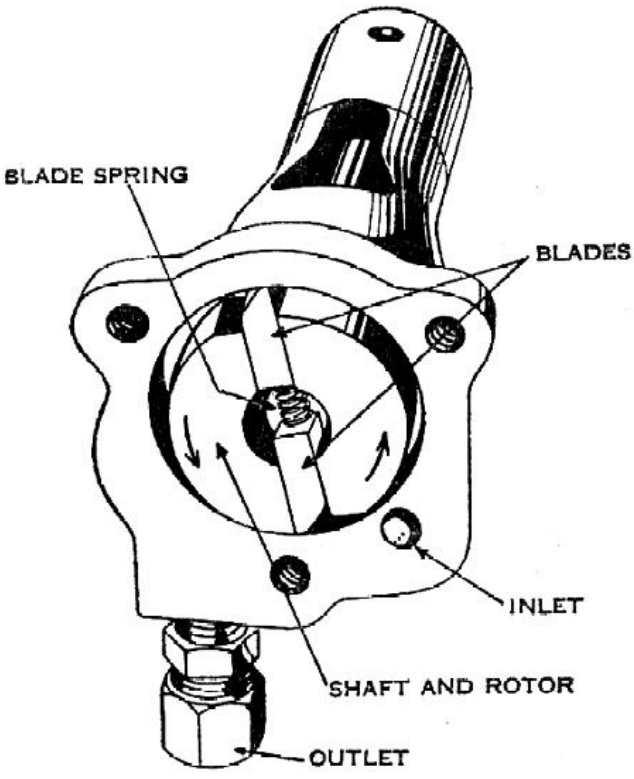


Fig. 12—Oil Pump

The oil splashers on the ends of the connecting rods strike the oil, a portion of it being forced up into the connecting rod bearing. The rest is broken up into a fine spray or oil mist which penetrates to all moving parts of the motor, lubricates them and in turn drains back to the oil reservoir where it is picked up by the pump and used again.

The oil pump (Fig. 12) and oil distributor (Fig. 13) require practically no attention other than to make sure that the oil at all times does not contain foreign matter of any

kind. Be sure to use good oil free from all foreign substances or dope. Do not use a heavy oil for the reason that heavy oil will not atomize properly and is likely to cause parts of the motor to be under lubricated.

The oil pump (Figure 12) rotates counterclockwise and draws the oil from the oil pan, into the oil pump body through the inlet and the blades push it around until it reaches the outlet, thus keeping a constant pressure in the system when the motor is running.

The oil distributor valve is assembled with a separate valve seat, on which it is held by a spring (Fig. 13) Oil coming from the pump is

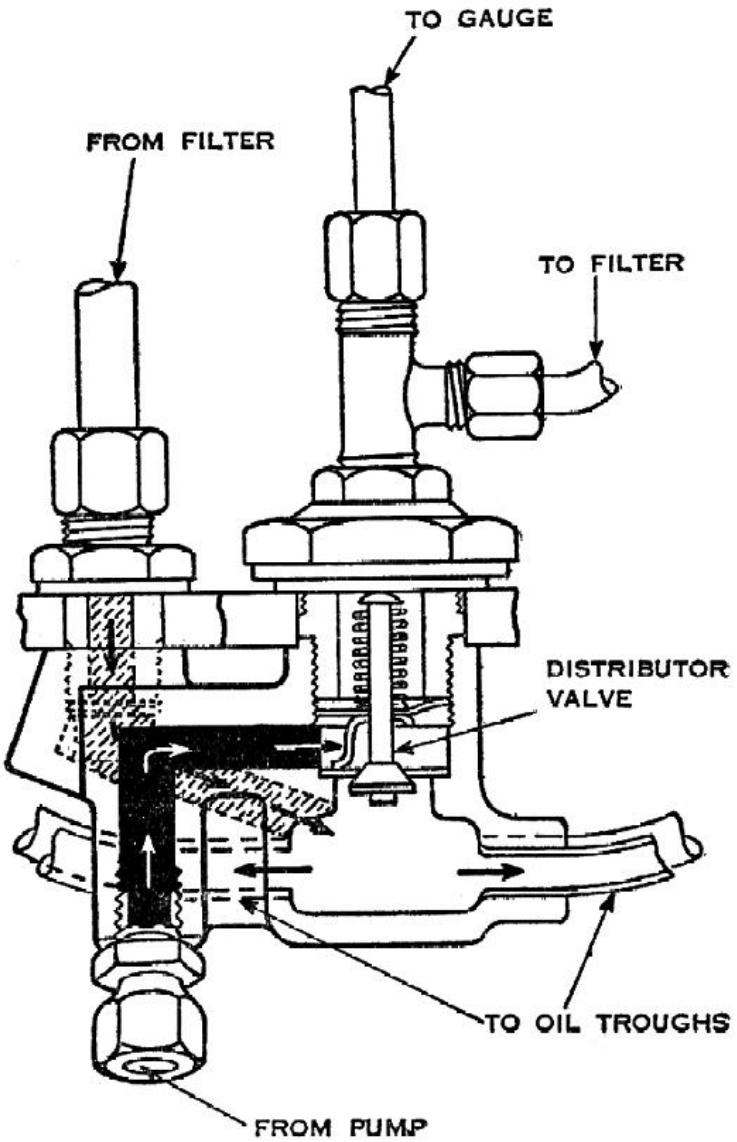


Fig. 13—Oil Distributor

free to rise above the valve assembly into the gauge line, but before it enters the distributor pipes it must pass through the holes of the valve seat, and force the valve off its seat against the spring pressure.

Keep all oil pipe connections and gaskets air and oil tight.

Should the oil gauge fail to register at any time, the cause should be investigated at once paying particular attention to all connections and gaskets.

Inspect the oil pump, making sure that the blades are not worn or the spring weak.

Examine the worm on the cam shaft and the oil pump drive shaft gear or pin, they may be damaged or broken.

Should the connecting rod bearings appear to be starved or lack sufficient oil, examine the oil pipes leading from the oil distributor to the oil troughs to see that they are in proper position and not dented or plugged with dirt so that the oil is not reaching the oil trough.

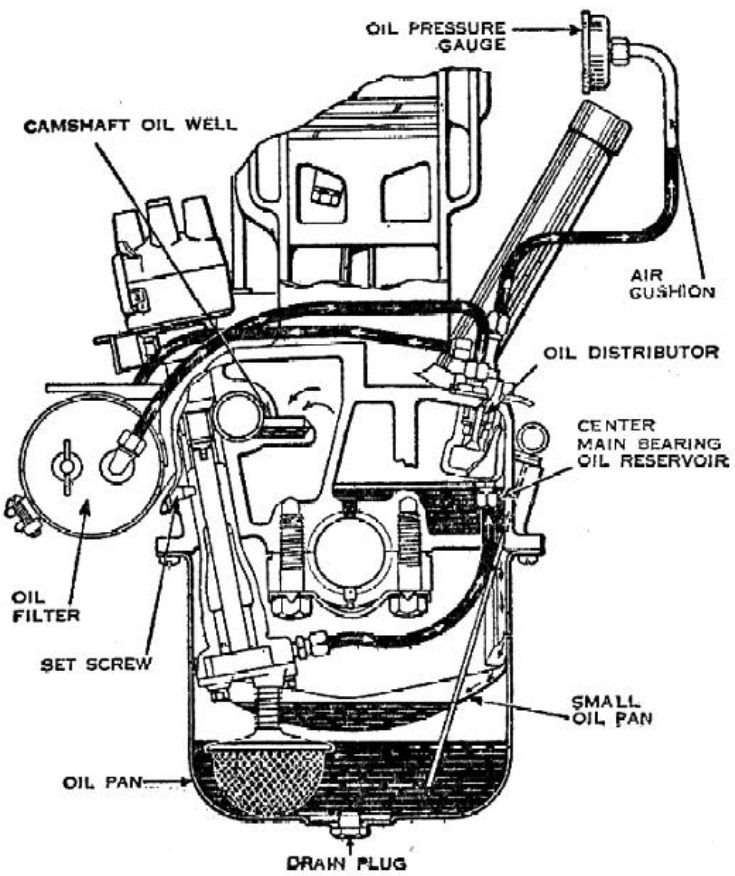


Fig. 15—Sectional view of engine lubricating system.

NOTE—Oil splasher on end of connecting rod dips 1/16" in oil in small oil troughs

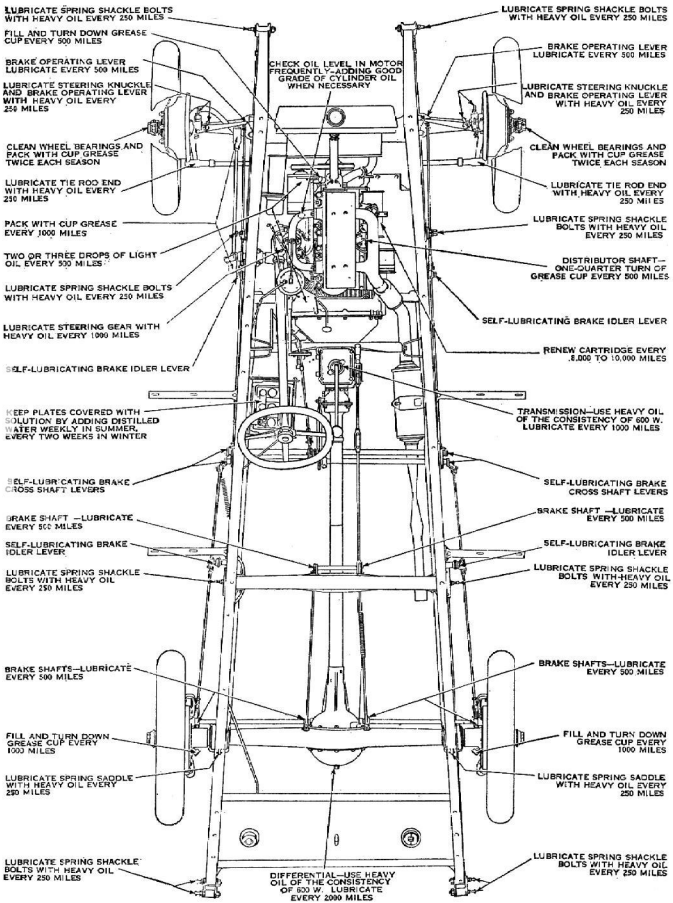


Fig. 14—Lubrication Chart

This chart may be removed and tacked on Garage wall for reference.

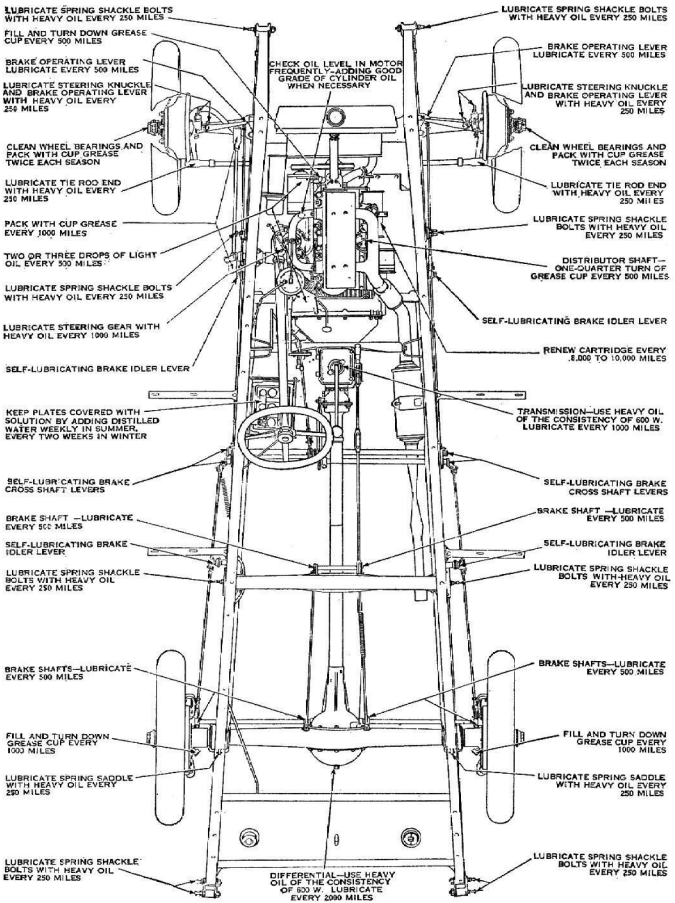


Fig. 14—Lubrication Chart

This chart may be removed and tacked on Garage wall for reference.

The main bearings and camshaft bearings collect oil from the splash in depressions or reservoirs located over each bearing and the oil is fed to these bearings through oil holes or channels leading to the bearings themselves.

The pistons and cylinder walls are constantly bathed in the oil spray, thus insuring ample lubrication at all times the motor is in operation. The piston pins are taken care of in a similar manner. In fact, ample provision has been made to care for the proper lubrication of all parts of the motor provided a good supply of oil is maintained.

The oil in the oil reservoir should be drained out at frequent intervals and a supply of fresh, new oil added to insure long life and freedom from expensive repairs.

See Figure 1, Page 8, and be sure to keep the oil level up to the full mark on the oil gauge rod.

Should difficulty develop with the oiling system, the Chevrolet dealer or nearest Chevrolet service station should be consulted immediately.

OIL PRESSURE GAUGE

It should be noted that the oil gauge is an indicator only and merely shows whether the pump is working or not. The amount of pressure (12 lbs.) shown on the oil pressure gauge does not necessarily tell anything about the condition of the oil in the crankcase. Inferior or dirty oil may show sufficiently high pressure, therefore it is necessary to follow instructions relative to changing oil (See page 34) in order to insure a supply of fresh clean oil in the crankcase at all times. If the oil pressure gauge fails to operate consult the Chevrolet dealer or service station at once.

CLUTCH

The clutch used on the Chevrolet Superior car is a standard plate clutch. The driving disc is made up of steel segments mounted on a clutch hub which is engaged by two clutch friction rings placed on either side of the driving disc.

The clutch pressure is maintained by eight coil springs evenly spaced around the area of the disc. There is only one adjustment necessary on the clutch and that is to keep the clutch pedal in its proper position and so that it does not touch the floor board at any time.

Refer to Fig. 16, and note clutch pedal adjusting bolt and nut.

If at any time the clutch pedal is less than three-fourths of an inch away from the end of the slot in the floor board, when the clutch is fully engaged, the clutch pedal adjusting bolt nut should be turned to the right until the clutch pedal is at least three-fourths of an inch away from the end of the slot in the floor board.

It is well with the first indication of any difficulty with the clutch to consult the nearest Chevrolet Service Station or dealer.

Do not disengage the clutch when starting the motor.

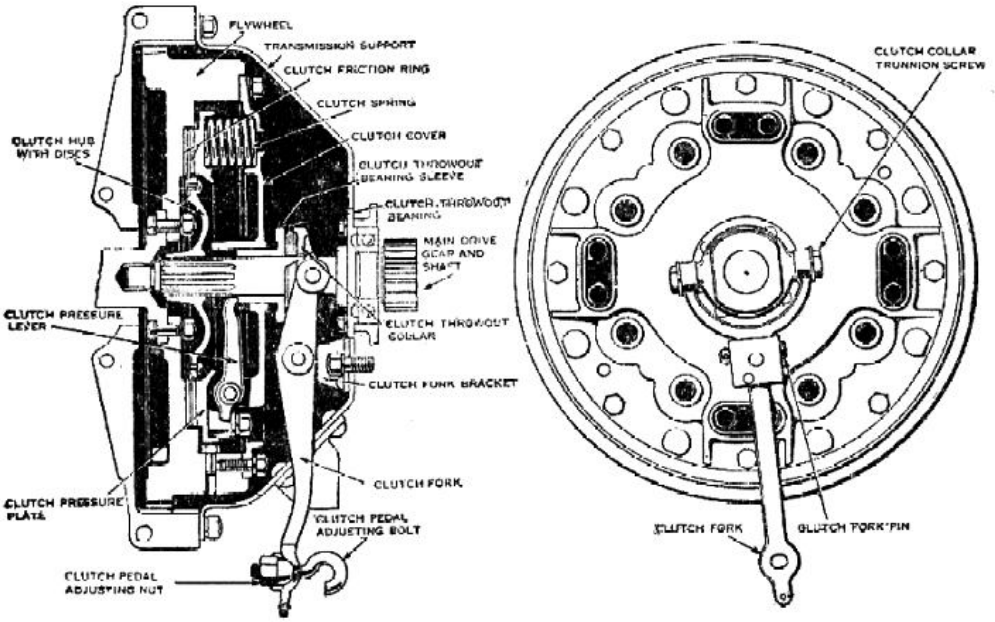


Fig. 16—Clutch and operating mechanism.

CARE OF CLUTCH

Do not lubricate the clutch.

The clutch is designed so that the clutch throwout collar and pilot bearing are both self lubricating and no oil or grease need be applied at these points, and care should be exercised to keep oil and grease away from the clutch disc and clutch friction rings.

TRANSMISSION

The transmission is of the selective type, having three speeds forward and one reverse.

The fundamental requirement is in every case to first engage the gears so that the entire tooth "face" of the sliding gears mesh with those on the countershaft and second, to properly lubricate all working parts. Proper engagement can be had by being sure when shifting gears that the gear-shift lever travels as far forward or backward as it will go without straining before re-engaging the clutch.

LUBRICATION OF TRANSMISSION

To lubricate the transmission, fill every 1,000 miles with a heavy oil such as 600W, not grease, so that the oil level stands even with

the opening in the filler boss on the right side of the case. In cold weather we recommend the addition of a pint of light engine oil to the heavy oil in the transmission which improves the lubricating qualities and makes it easier to shift gears and start the motor.

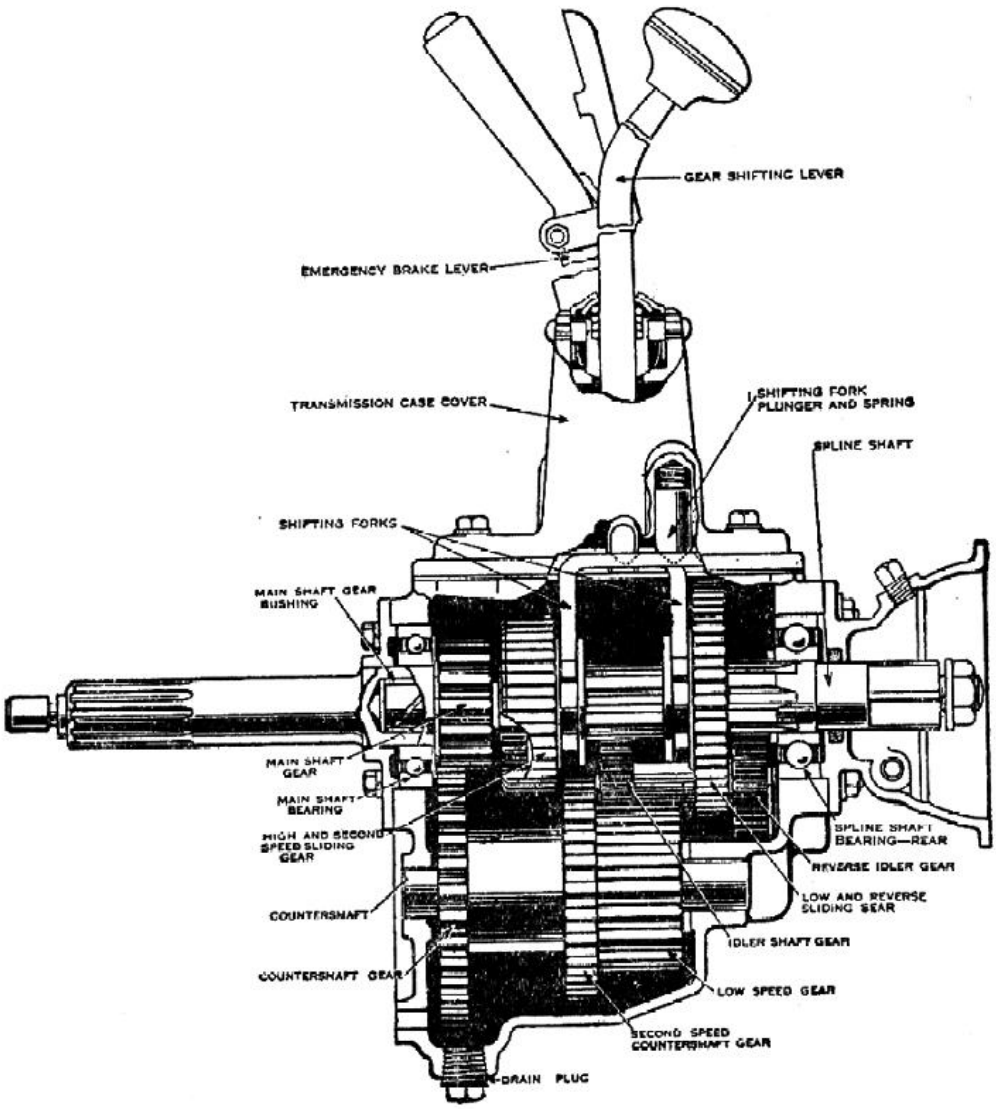


Fig. 17—Sectional View of Transmission.

Once every 2,000 miles it is a good plan to wash out the transmission with a light oil to remove any chips of metal knocked off the gears, or other foreign substances such as grit or dirt. To do this, remove the drain plug at the bottom of the transmission case and allow the oil to drain off, after which flush out the case thoroughly and refill with a heavy oil such as specified in Fig. 14.

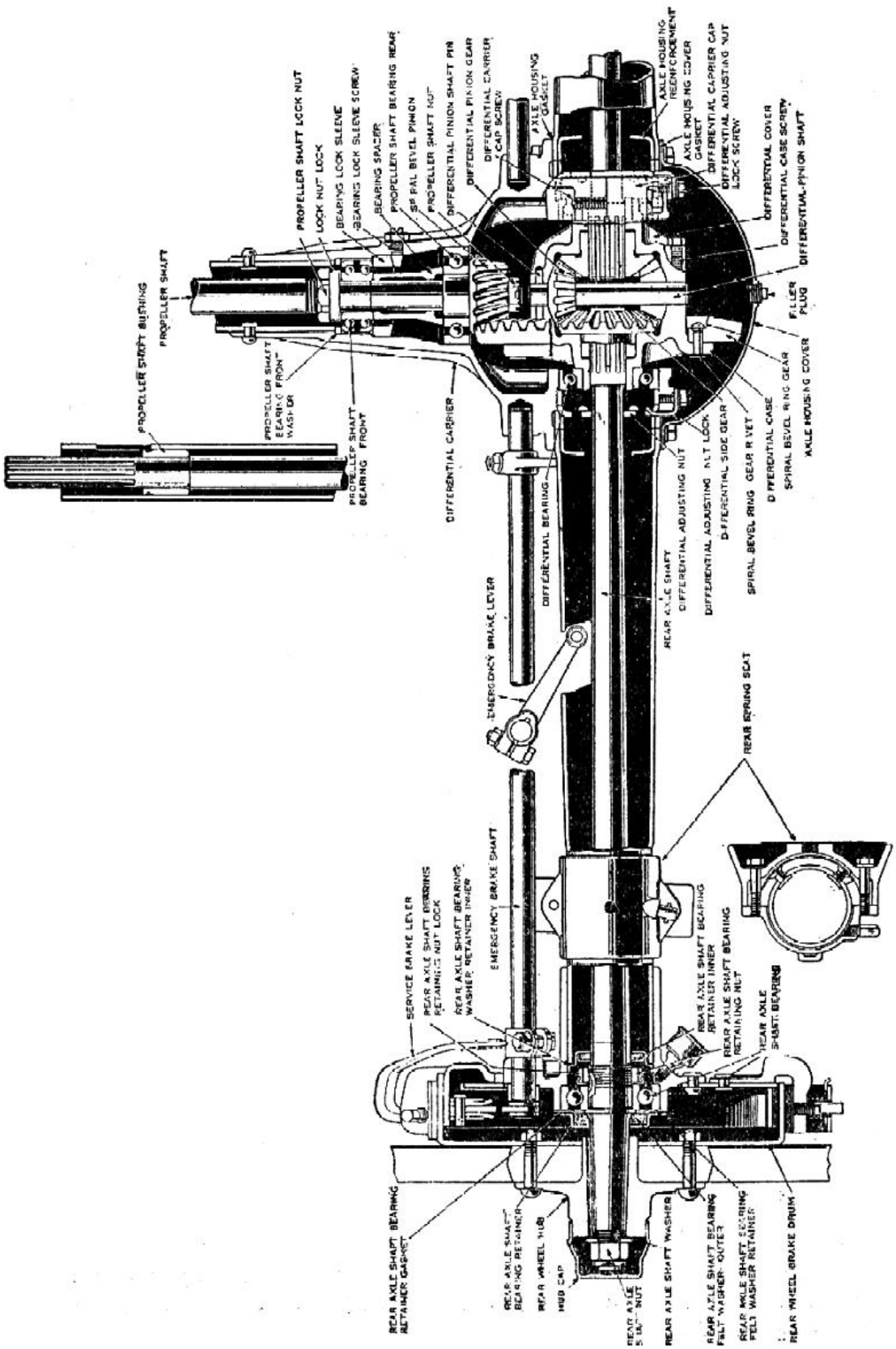


Fig. 18—Sectional View of Rear Axle

REAR AXLE

The rear axle on the Chevrolet cars is of the semi-floating type.

The axle shafts are supported on the outer ends by heavy duty ball bearings fitted to the axle shaft.

A glance at the illustration Fig. 18 shows the construction and relative positions of the various units.

REAR AXLE NOISES

In some axles there is a slight and steady hum which is usually present when gears are used, whether in an axle or otherwise. This noise should not be confused, neither should the motorist become alarmed if it continues steady and uniform.

If a loud noise develops, there is no absolute method of diagnosis except to have the axle disassembled and an examination made of it by a reliable mechanic.

LUBRICATION

A heavy oil of the consistency of 600W should be used to lubricate the differential, and should be renewed every two thousand miles. By removing the oil plug on the rear of the axle housing cover the amount of oil in the housing can be determined. The housing should be filled until the oil is level with the lower edge of the opening from which the oil plug was removed. See Fig. 14.

REAR WHEEL BEARINGS

Heavy duty ball bearings mounted on the axle shaft carry the car load and insure a minimum of power loss and upkeep cost. Outside of seeing that these bearings are properly lubricated they should require no further attention from the owner.

Refer to Fig. 18, Page 45, where these parts are fully illustrated.

BRAKES

The service brakes are the outside or external bands at the rear wheels and the internal expanding shoes at the front wheel. The service brakes contract on the outside of the rear brake drums and expand on the inside of the front brake drums. The emergency brakes expand against the inside of the rear brake drums.

ADJUSTING FRONT WHEEL SERVICE BRAKES

Front brakes are designed for minimum shoe clearance at the toe. They should be so adjusted that the toes of the brake shoes just touch the high spots on the drums.

To properly adjust front wheel brakes, proceed as follows:

After raising both wheels from the floor by means of a jack or other lifting device, test the front wheel bearings for play. If it develops that the wheels need tightening on the steering knuckles remove hub caps and tighten the wheel by means of turning the steering spindle nut.

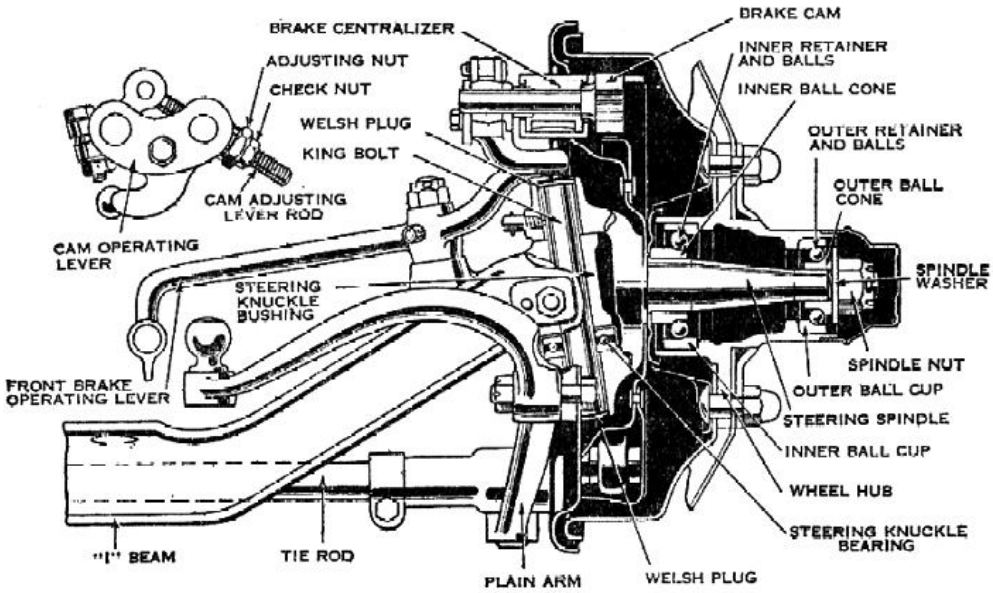


Fig. 19—Adjusting Front Wheel Brakes

The front brake operating levers should always be in contact with the lever stops (Fig. 19) with the brake pedal released. If the lugs on the operating levers do not touch the stops they can be made to do so by turning the yokes at the front brake rod ends. However, first examine the brake cross shafts to see that they are not binding. (Fig. 22.)

Loosen the check nut (Fig. 19) and turn adjusting nut to the left (as you face the radiator) until the brake shoes begin to drag slightly in the brake drum. Then depress the brake pedal two or three times in order to centralize the brake cam. Repeat these operations until the brake drags slightly on all high spots in the drum. Then turn adjusting nut to the right one half turn and securely lock the check nut. GREAT CARE SHOULD BE EXERCISED NOT TO DISTURB THE ADJUSTING NUT WHEN TIGHTENING THE CHECK NUT.

Front wheel brake adjustment should be performed on both brakes simultaneously.

ADJUSTING REAR WHEEL SERVICE BRAKES

When adjusting the rear wheel service brakes both rear wheels should be jacked up so that each wheel may be turned to see that it is free when the brakes are released; i. e., to insure that the service brake bands do not drag on the brake drums. When proper adjustment is made the brake bands will clear the brake drums by approximately $\frac{1}{32}$ of an inch all the way around the drum.

First see that both external brake levers at the rear axle rests against the stop collars on the brake shafts. (Fig. 22.) If the lugs on the levers do NOT rest against the stop collars make the necessary adjusment at the adjustable rod ends of the service brake rear pull rods. However, first examine the brake cross shafts to see that they are not binding.

Refer to Figure 20. Raise the service brake band guide pin lock plate and push it toward the wheel so that the brake band guide pin may be free to turn and so that the brake band guide pin lock plate is in the position indicated in Sketch "B." This will allow the brake band guide pin to be turned either to the right or left as the case may be, thus bringing the service brake band to its proper position so that it just clears the brake drum by $\frac{1}{32}$ of an inch, after which the brake band guide pin lock plate should be returned to the position shown in Sketch "A," thus locking the brake band guide pin in position. A piece of ordinary hack saw blade with the teeth ground off makes a good feeler for this purpose.

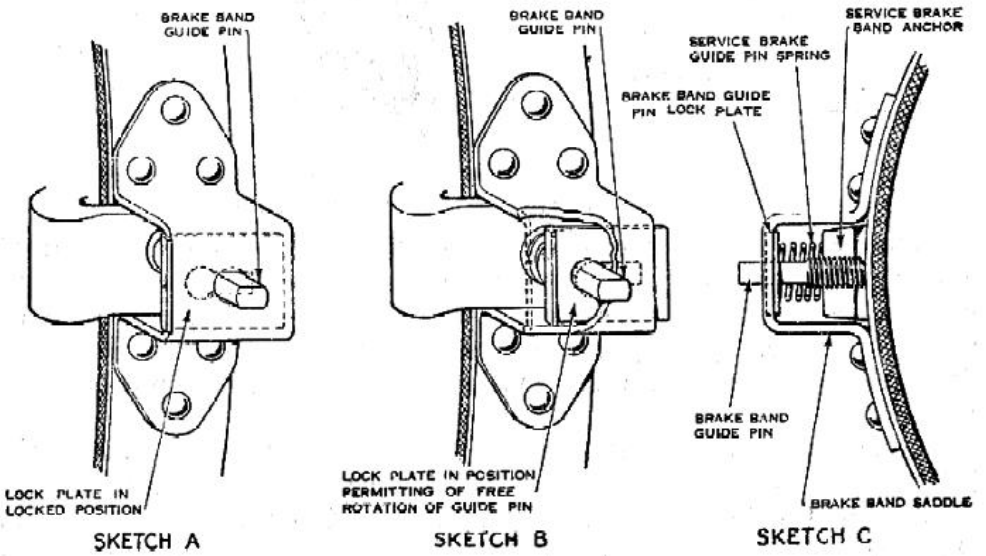


Fig. 20—Brake Guide Pin and Lock Plate

Refer to Figure 21. And if the upper half of the brake band is too close to the brake drum, loosen the check nut and turn the service brake adjusting nut to the left until it is at or near the top of the threads on the service brake adjusting screw. Next, loosen the adjusting screw jam nuts, shown in Fig. 21, and adjust the lower half of the brake band to a position so that it clears the brake drum by $\frac{1}{32}$ of an inch, then tighten the jam nuts. Then turn the service brake adjusting nut at the top of the service brake band adjusting screw to a position so that the top half of the brake band clears the brake drum by $\frac{1}{32}$ of an inch.

If there are any irregularities or bends in the brake band, it will be necessary to remove them with a hammer or mallet so that the band will set at an equal distance all around the brake drum.

When these settings have been made on both brake bands the brakes will operate properly. After the brakes have been adjusted in this manner, FURTHER ADJUSTMENT TO COMPENSATE FOR WEAR SHOULD BE MADE AT THE BRAKE DRUMS AND NOT AT THE ENDS OF THE RODS.

ADJUSTING REAR WHEEL EMERGENCY BRAKES

When the hand brake lever is pulled back as far as it will go without stopping the forward movement of the car, shorten the rod between the hand brake lever and the brake cross shaft by loosening the lock nuts on each side of the "Emergency Brake Rod Adjustment" and turn the turn-buckle to the right or clockwise. This adjustment controls the braking action of the emergency brake on both rear wheels and in the event that one brake should grab or take hold too quickly, they can be equalized by loosening the lock nuts just back of each emergency brake equalizer (See Fig. 22) and turn the brake rod yoke to the right to tighten and to the left to loosen.

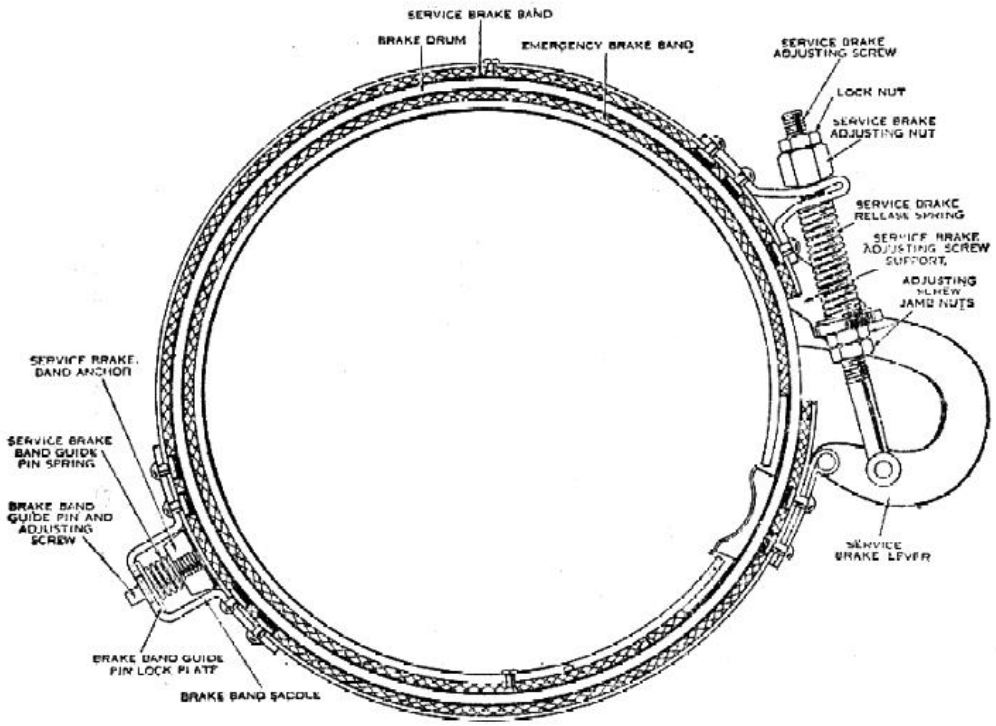


Fig. 21—Brake Band Adjustments

After several adjustments have been made, the brake levers on the cross shaft at the emergency brake equalizer may stand too far forward. This may be remedied by loosening up on the turn-buckle and then shorten the rear emergency brake pull rods by means of the adjustable rod ends. These levers should point down and toward the rear axle; that is, back of the vertical with the emergency brake released.

Examine the brakes frequently and if after considerable use you find that practically all of the available space for adjusting has been used, new brake linings should be installed. Do not neglect your brakes.

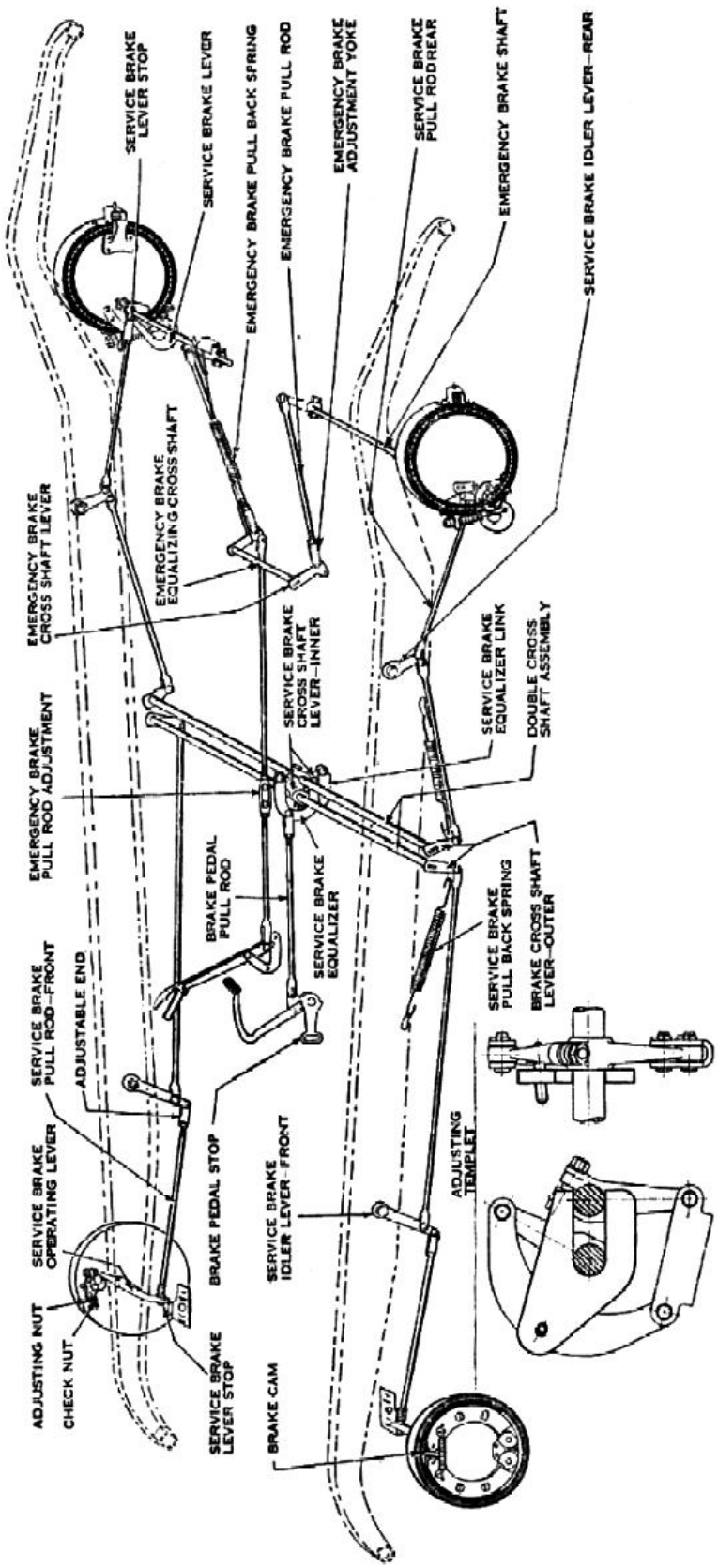


Fig. 22—Brake Rods and Levers

ADJUSTING CHASSIS LINKAGE FOR FOUR-WHEEL BRAKES

The double cross shaft assembly illustrated in Fig. 22 serves to regulate the proportion of brake pressure exerted on the front and rear service brakes. To properly adjust the service brake chassis linkage, proceed as follows:

Adjust the brake pedal pull rod (Fig. 22) so that the brake pedal rests against the stop on the clutch housing. Then the distance between the eyes of the outside levers of the brake cross shafts is 3⅝ inches. Then adjust the front and rear adjustable service brake pull rods, so that the front and rear brake levers rest against their respective stops.

When the brake cross shaft lever adjusting template is used, the outside brake cross shaft levers automatically assume their proper relative position.

STEERING GEAR

The steering mechanism used on Chevrolet cars has been designed to give the greatest ease of handling with the least amount of wear

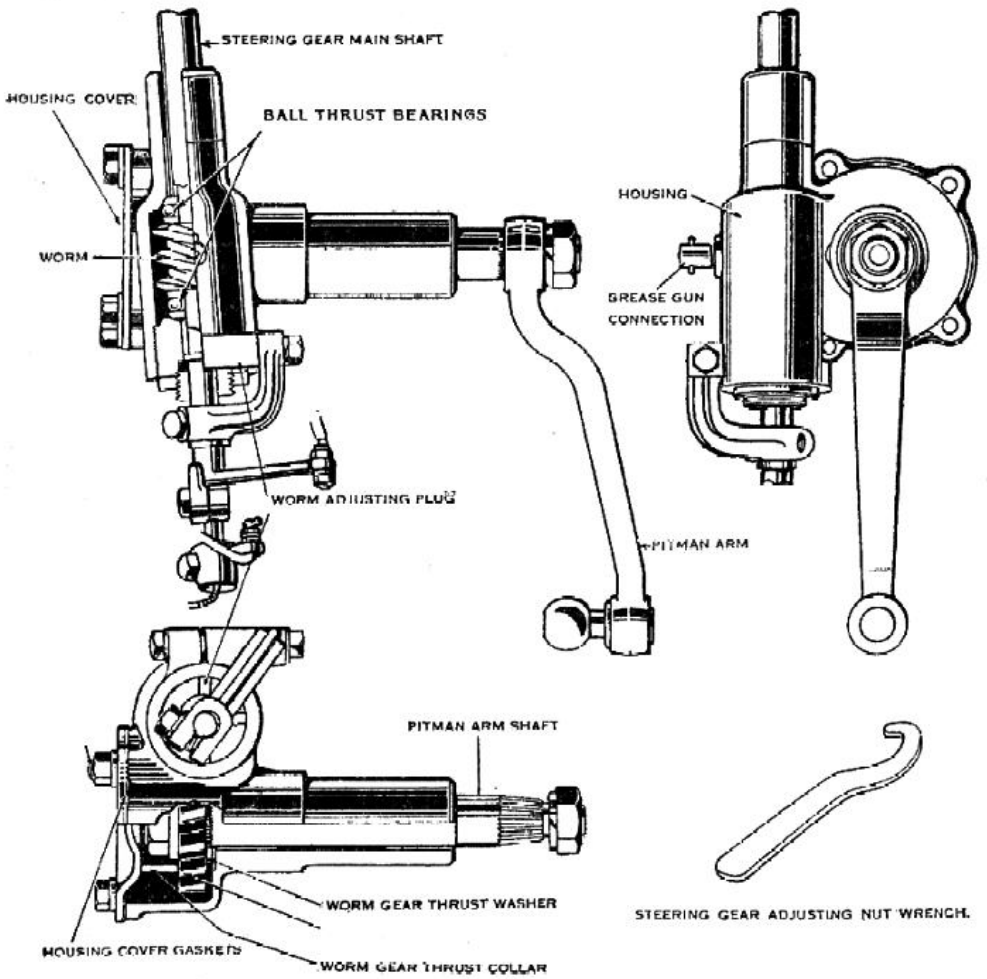


Fig. 23—Steering Gear.

and consequent adjustment. The ball thrust bearings above and below the steering worm insure quietness and easy steering.

Go over all the connections regularly and tighten any bolts or nuts which are loose, supplying grease and oil where needed, as this is the only safe insurance against a costly accident. At the first sign of excessive wear or looseness consult the Chevrolet dealer.

LUBRICATION OF STEERING GEAR

The steering gear should be well lubricated at all times. Use a high grade of heavy oil forcing a liberal quantity into the steering gear through the grease gun connection, (See Fig. 23) every 1000 miles by use of the grease gun. (See Oiling Chart, Fig. 14.)

FRONT WHEEL LUBRICATION

The front wheels run on New Departure ball bearings which are lubricated (See Fig. 14, Lubrication Chart) by packing the bearings with soft cup grease. In mounting the front wheels, be careful to thoroughly saturate the bearing assembly with grease (Fig. 19). The best lubricant for front wheel bearings is a straight mineral grease entirely free of asbestos fibre or other foreign matter.

By cramping the front wheels as indicated in Fig. 24, the three Alemite fittings are accessible for easy lubrication with an Alemite Gun from the front of the car. After lubricating the steering knuckle on one side of the car, cramp wheels in the opposite direction and repeat the oiling operation at the three Alemite fittings on the opposite side.

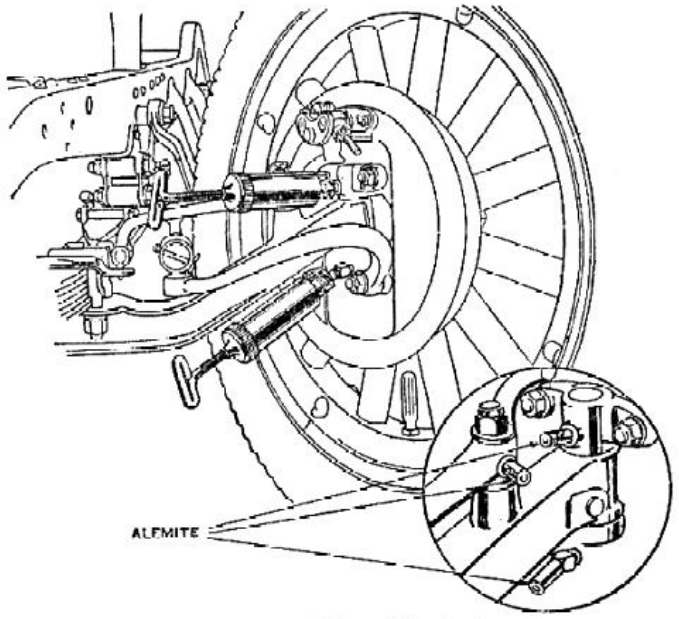


Fig. 24—Front Wheel Lubrication

The lubrication of the king bolts should not be overlooked. (Refer to Oiling Chart Fig. 14.) The king bolts should be lubricated every 250 miles. Use a high grade heavy oil with a consistency of 600W. Do not use oil having graphite or other substances of this nature in it.

FRONT WHEEL ALIGNMENT

To make steering easy it is required that the front wheels should "toe" in; that is, the distance between the inside faces of the wheel felloes, measured at the height of the wheel hubs, should

be from 0 to 1/8 in. more at the rear than at the front. This causes the wheels to grip the road better, and allows the car to hold its course without undue action on the steering mechanism.

By referring to Fig. 25, the distance indicated by line B; i. e., between the inner sides of the wheel felloe at the rear of the front wheels should be from 0 to 1/8 inches greater than the distance indicated by line A.

The best method of checking these measurements is by use of a front wheel tramming device such as is shown in Fig. 25. Almost any good repair shop or tire station is equipped with one of these devices and will be glad to check the alignment of the wheels for you.

If it is found that the front wheels do not have the proper "toe in," that is from 0 to 1/8 inches, loosen the adjusting clamp screw at both ends of tie rod as shown in Fig. 25 and with a small pipe wrench or pair of pliers, turn the tie rod to the right to shorten the tie rod and reduce the distance shown in Fig. 25 as "B." To increase the distance indicated in Fig. 25 by line "B," turn the tie rod to the left.

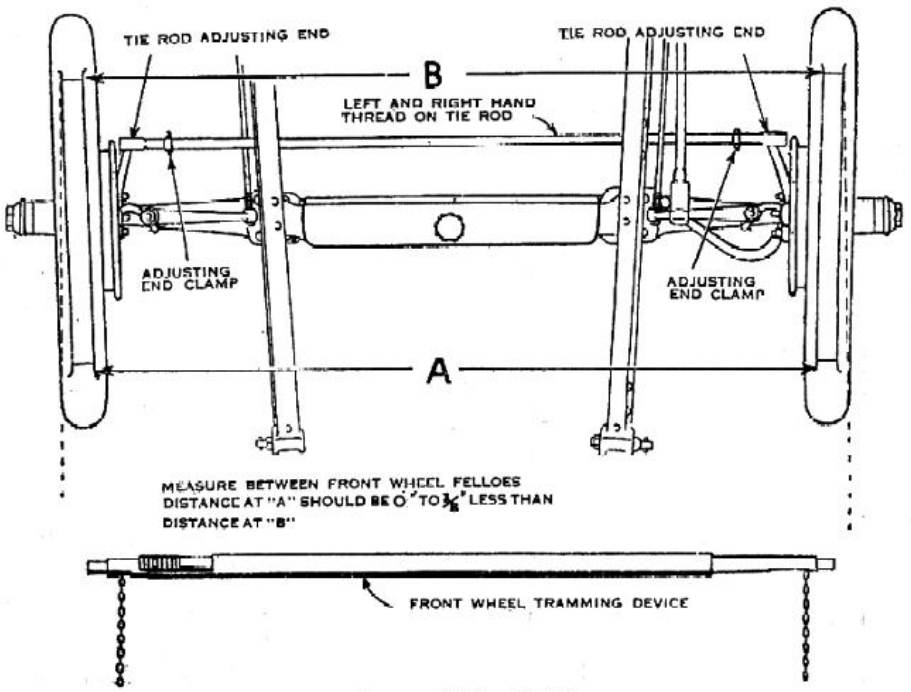


Fig. 25—Front Wheel Alignment

Turning the tie rod to the right will increase the distance shown as line "A" in Fig. 25 and turning the tie rod to the left will decrease the distance indicated by line "A" in Fig. 25.

After proper adjustment has been secured, be absolutely certain to fasten both adjusting clamp screws firmly as failure to do so may result in a serious accident to the car or occupants.

The lubrication of the tie rod ends is very important, therefore be sure to follow the instructions on the Oiling Chart, (Fig. 14,) carefully.

CARBURETOR

The Carburetors used on Chevrolet cars have been carefully tested and adjusted to the motor before leaving the factory. No adjustments should be made by the owner as it has been found by experience that those made at the factory are proper for all changes in gravity and atmospheric conditions when the motor has been heated to a proper temperature. **If the carburetor on your car appears to be giving trouble consult the Chevrolet dealer.** Too often adjustments of the carburetor are made when in reality something else is causing uneven running or the motor has not thoroughly warmed up. It is well to remember that any changes in a carburetor's action will usually come gradually and not suddenly. Therefore if your car was operating properly when run last, you may depend upon it that some other part of the motor is at fault and the trouble should be located and corrected before attempting alterations to the carburetor.

GASOLINE TANK

Gasoline served at most filling stations is filtered but all other gasoline should be carefully strained before being placed in the tank to remove the sediment which will eventually clog the filter screen in the carburetor

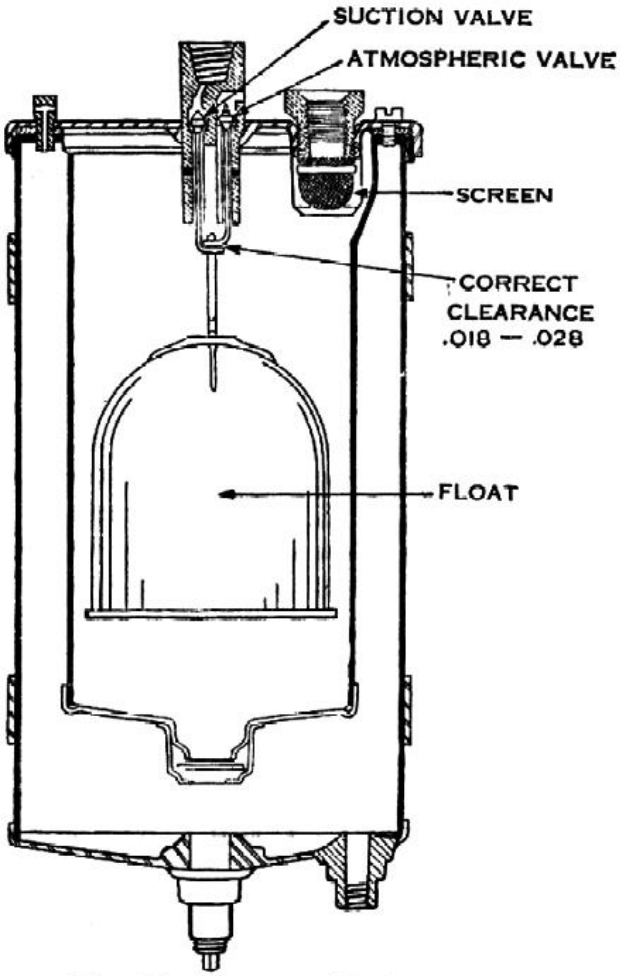


Fig. 26—Vacuum Tank

Vibration will in time cause a loosening of the gasoline pipe connections, causing leaks. Remedy these as soon as they appear, as they are dangerous and also wasteful of fuel.

In order that the gasoline will flow properly to the carburetor, there is a small hole in the top of the filler cap on the tank so that air can enter as the quantity of gasoline in the tank is decreased. It is essential that this hole be kept open.

VACUUM TANK

The Stewart Warner vacuum tank (Fig. 26) is in production on all cars and trucks.

When the float is in its lower position, it

closes the atmospheric valve, thus drawing gasoline into the inner tank. During this period, the atmospheric pressure in the outer tank closes the flapper valve at the lower end of the inner tank. For correct valve action clearance should be .018 to .028 inches as shown.

When the float is raised to the point where it closes the suction valve, stopping the flow of gasoline to the inner tank, and opens the atmospheric valve, the gasoline then flows to the reserve or outer tank through the flapper valve in the lower end of the inner tank.

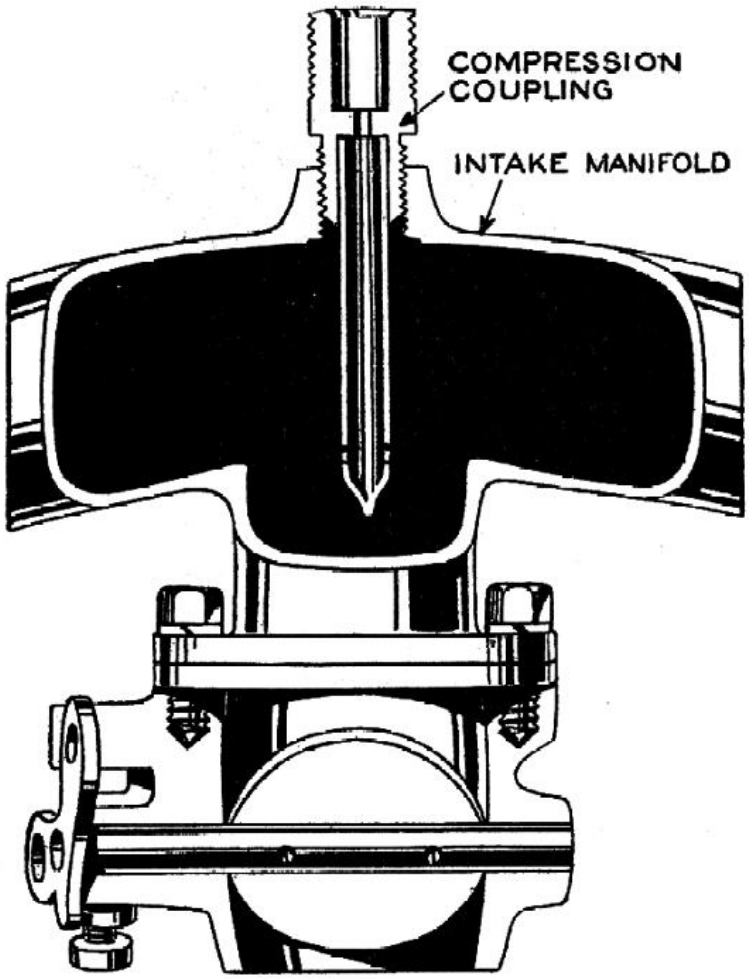


Fig. 27—Vacuum Tank Compression Coupling

A coupling (Fig. 27) is assembled into the manifold directly above the carburetor and extending into the manifold to a point where the suction is greatest.

Please note that in the case of improperly operating mechanisms there are two assemblies which cannot be taken apart and must be replaced complete. They are the tank cover assembly and the inner tank with the flapper valve.

When it becomes necessary for any reason to dis-assemble this vacuum tank and remove the top cover assembly, a **New** Cork gasket should **Always** be used to eliminate the possibility of leakage.

AIR CLEANER

The principle of the Chevrolet Air Cleaner is similar to that of the ordinary cream separator, in that centrifugal force is used to separate two substances of different specific gravities. In this case it is air and dust. According to accurate measurements, ten thou-

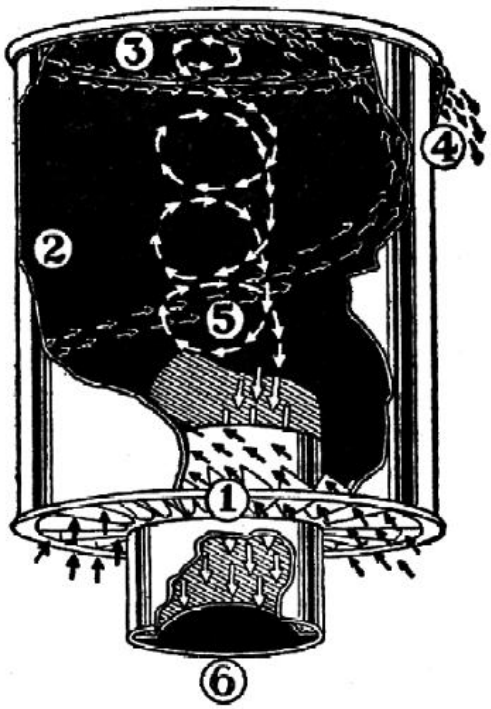


Fig. 28—Air Cleaner

sand gallons of air are consumed for every gallon of fuel used by the engine. Road dust pollutes this air and very severely wears the moving parts, because it is composed largely of minute particles of sharp-edged sand or quartz. Dust, when drawn in with the carburetor air, mixes with the oil film on the cylinder walls, where it grinds away the efficiency of the engine with each piston stroke.

Dust is eliminated as follows:

1. Suction stroke of engine draws dust-laden air through stationary directing vanes, which gives it a rapid, spirally-rotating motion.

2. Centrifugal force separates the dust particles from the air, throwing them against the inside wall of the cleaner.

3. The spiral movement of the dust along the inside surface of the cleaner wall brings it to rear circular end.

4. The momentum of the dust particles, together with the suction produced by the air flow across the specially shaped dust exit, causes them to be thrown out of the cleaner.

5. Clean air, indicated by white arrows, rotating spirally in center portion, strikes directing plate and twists itself out of the cleaner.

6. Straightened current of clean air leaves cleaner to enter carburetor.

IGNITION

The engine derives its power from the explosion and expansion of compressed gas in the engine cylinders, the expansion driving down the pistons, which produces power.

These charges of gas are ignited by an electric spark made in the cylinder.

The primary current, which ranges from six to eight volts and is distributed at regular intervals by the breaker arm contacts in the distributor to the coil, through the primary wire, where it is transformed to a high tension or secondary current which flows to the distributor through the high tension wire and from the distributor to the spark plugs.

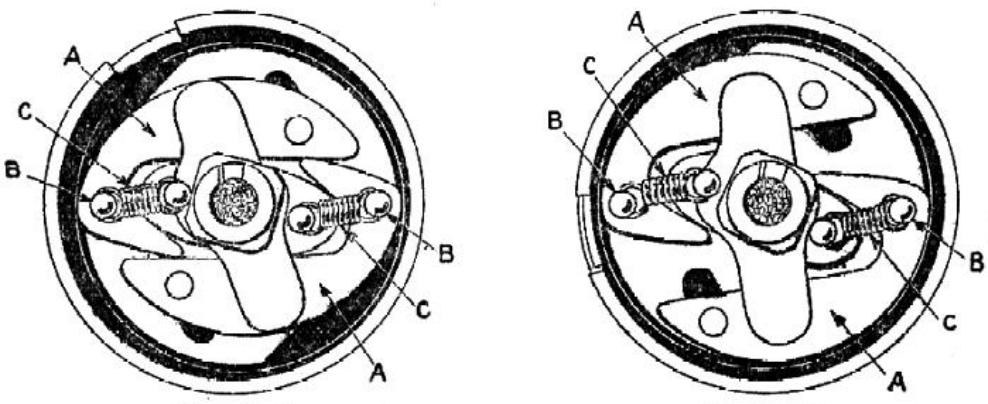
The ignition equipment used on Chevrolet Cars is designed to give an even hot spark at all times regardless of engine speed. It is therefore possible to run your car at slow speeds with an even flow of power, also to accelerate the power without stalling.

DISTRIBUTOR

The Distributor (Fig. 29) is the Semi-Automatic Type, which means that the spark is operated both manually and automatically.

Fig. 29, shows the Distributor with breaker plate removed. In this mechanism, there are two weights "AA" hinged at point marked "BB." They are held in position, shown by springs "CC."

At car speeds below 22 miles per hour, the automatic feature does not function, and the only variation in firing is obtained by the spark control lever on the steering wheel. At car speeds of 22



Sketch 1 Sketch 2

Fig. 29—Distributor

miles per hour or more, centrifugal force begins to throw both weights out until, at a maximum speed, they reach the point as shown in Sketch No. 2. In their outward movement, because of the manner in which they are connected with the cam, they advance the position of the cam beyond the point shown in Sketch No. 1, and therefore advance the firing of the motor.

The Distributor requires no special attention, except turning down the grease cup one-quarter turn every five hundred miles and occasionally examining the spring contact point on the top of the distributor arm. This spring makes contact with the center point in the distributor head.

ADJUSTING BREAKER POINTS ON SEMI-AUTOMATIC DISTRIBUTOR

The contact points on the Semi-Automatic Distributor are fixed in their mountings; and are controlled by an eccentric screw moving the mounting plate (Fig. 30.)

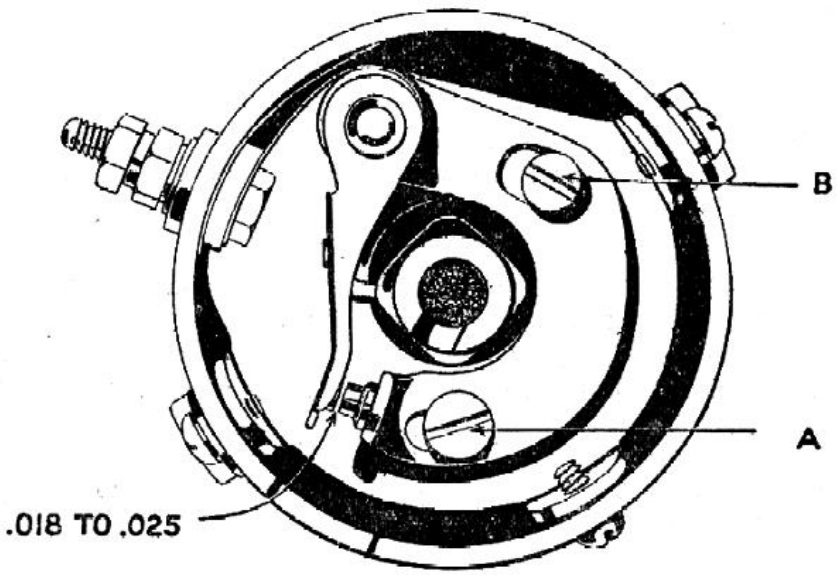


Fig. 30—Adjusting Distributor Breaker Points

To adjust the gap, proceed as follows:

1st—Turn the motor over until the cam is in the position shown in Fig. 30. The contact points are then open the maximum distance.

2nd—Loosen set screw "A."

3rd—Turn eccentric adjusting screw "B" to the right or left, increasing or decreasing the gap to the desired distance, Correct breaker point gap is .018 inch to .025 inch.

4th—When properly set, lock in position by tightening set screw "A."

The contact points will require little attention or refiling, even though they may be very rough and irregular. When they become so badly burned as to cause missing they should be "trued" so that their contact surfaces are exactly parallel. The best way to do this is to secure a thin Swiss or jeweler's file, insert the blade between the contact points, then press them together firmly with the fingers at the same time withdrawing the file.

ELECTRIC STARTING AND LIGHTING SYSTEM

The system used on Chevrolet cars is the one wire common return two unit system. See wiring diagram on page 63 for details of this system.

CARE OF BATTERY

Practically all cause for failure of the battery may be eliminated by observing four things: cleanliness of the battery, keeping all connections tight and clean, and by adding pure distilled water at the proper intervals, and by keeping the battery fully charged.

Always keep battery clamped tight in its hanger and prevent repairs.

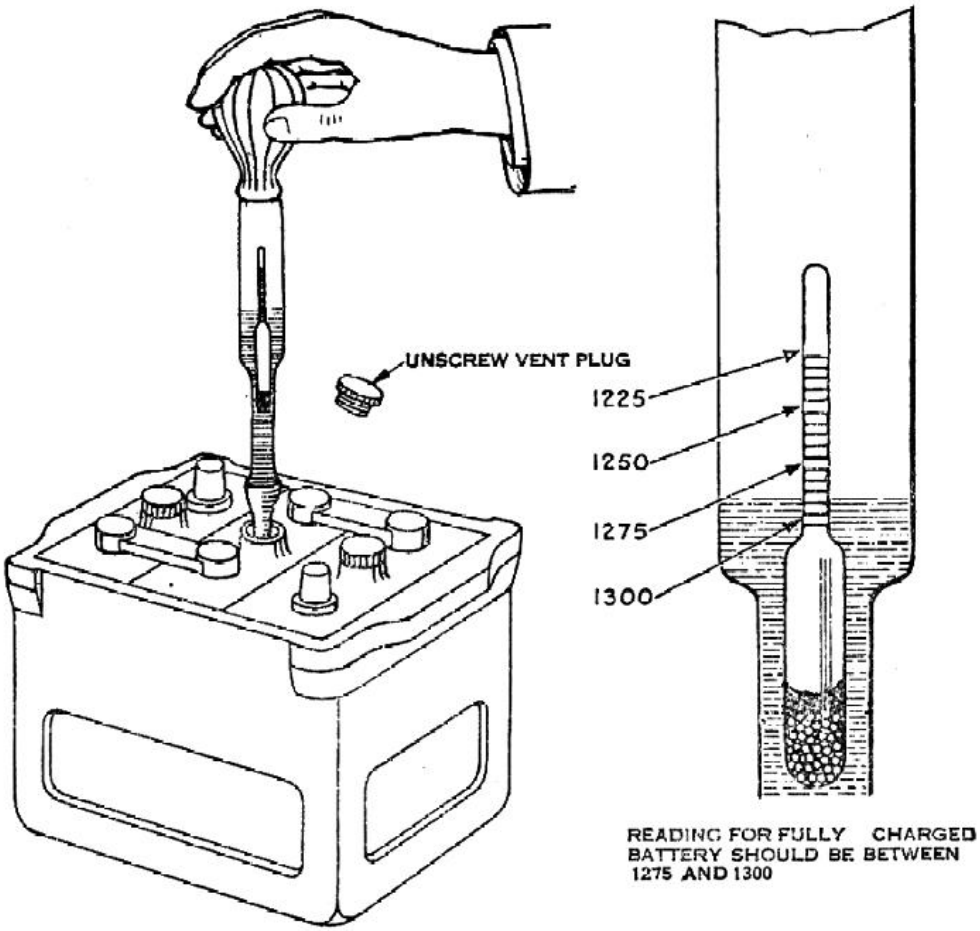


Fig. 31—Testing battery

When a new car is purchased, the owner should determine the make of the battery and go to the nearest battery service station maintained by that battery manufacturer immediately and have the battery registered and inspected in order to take advantage of the manufacturer's warranty and service plan.

If you buy a battery to replace the one you now have, it will be registered when sold to you.

Test all cells with a hydrometer on the first and fifteenth of every month. The specific gravity of a fully charged battery is between 1.275 and 1.300. If successive readings show lower values (for example 1.275 then 1.265 and on the third reading 1.250) this indicates that the battery is gradually becoming discharged. In other words, the battery is required to generate more current than the generator is sending back through the battery to keep it in proper charged condition. The generator in this case should be readjusted to deliver more current. Serious injury will result to the battery if the battery is not kept charged. In taking the readings, care should be exercised to return the electrolyte from the hydrometer syringe to the same battery cell from which it was taken.

Keep all cells filled with distilled water to a level ½" above the top of the plates. In warm weather, it makes no difference when water is added. In freezing weather it should be added just before using the car. The reason is that water will remain on top of the solution until it is mixed with it by action of the battery. If not mixed with the solution, it would freeze almost as quickly as outside of the battery. Water will be required more frequently in summer than in winter. It is a good plan to add water at least once a week in summer and every two weeks in winter. When long daylight runs are made, water must be added still more frequently.

Keep the battery and the battery compartment clean and dry. If electrolyte or acid is accidentally spilled or splashed over the top of the battery, wash all outside surfaces and the battery compartment with a solution of water and ammonia or Gold Dust and water, or common baking soda and water. Wipe dry—do not allow any of above solution to get into the battery cells.

Keep the terminals clean and tight and well covered with vaseline to prevent corrosion.

In order to prevent freezing in cold weather, test your battery frequently and see that the gravity is kept up to at least 1.250. A discharged battery will freeze at a little below the freezing point.

A battery showing a reading of 1.250 or more on the hydrometer will not freeze even at temperatures as much as 30° below zero Fahrenheit. **Keep the battery fully charged in winter.**

When filling, if one cell takes considerably more water than the others, this indicates a leaky jar and the battery should be taken or sent to a battery service station. Unless repaired immediately, the battery may be ruined.

TREATMENT OF BATTERIES IN STORAGE

If the car is to be placed in storage for any length of time without the battery being removed, it should be thoroughly charged. The hydrometer should show that the gravity of the electrolyte in each cell is between 1.275 and 1.300.

Tests should be made at intervals of two weeks, and if necessary the engine should be run until the hydrometer shows the reading given above. This is especially essential in freezing weather, as a battery in a discharged condition will freeze and considerable damage might result.

The proper method of handling a battery, if the car is to be placed in storage either in winter or summer, is to remove the battery from the car and take it to a Service Station where for a nominal sum it will receive proper attention, which will insure it against any damage resulting from standing in a discharged condition and the owner will derive the best results when the car is again placed in operation.

STARTING MOTOR

The starting motor is mounted on the clutch housing, having a pinion which automatically engages the flywheel when the starter button is depressed.

As soon as the engine starts under its own power the foot should be removed from the starter switch and the starter pinion will automatically be disengaged from the flywheel.

If when starting the engine the starter pinion goes into mesh with a bang or is accompanied by considerable noise while cranking, take your car to the Chevrolet dealer or service station and have it examined carefully. Repairs to the starting motor should not be attempted by the owner.

THE GENERATOR

The construction of the generator is as simple as such a piece of electrical equipment can be made and beyond a few drops of oil every 500 miles, requires no special attention.

The generator and connections should be examined occasionally to see that all are tight. If trouble in the generator is suspected or if the ammeter does not show a proper charging rate at ten to twelve miles an hour, the car should be taken to the Chevrolet dealer or Chevrolet service station for examination and possible repair. Repairs to the generator should not be attempted by the owner.

When cold weather arrives we suggest that you call at your Chevrolet dealer's service station or any branch of the United Motors Service and have the third brush on your generator advanced slightly, thus increasing the charging rate.

This suggestion is made because of the fact that more current is required in cold weather driving than in summer driving. This adjustment is not necessary except in cases where the battery does not retain its charge in cold weather. This adjustment should not be attempted by the owner unless he is sure that he is entirely familiar with what he is doing or has been instructed by one competent to do so.

FAN AND GENERATOR BELT ADJUSTMENT

The fan and generator belt is so designed that very little adjustment is required.

The belt should not be tight but should have a small amount of "slack" in it, only having sufficient tension to keep it from being thrown off the pulleys when the motor is run at a high speed.

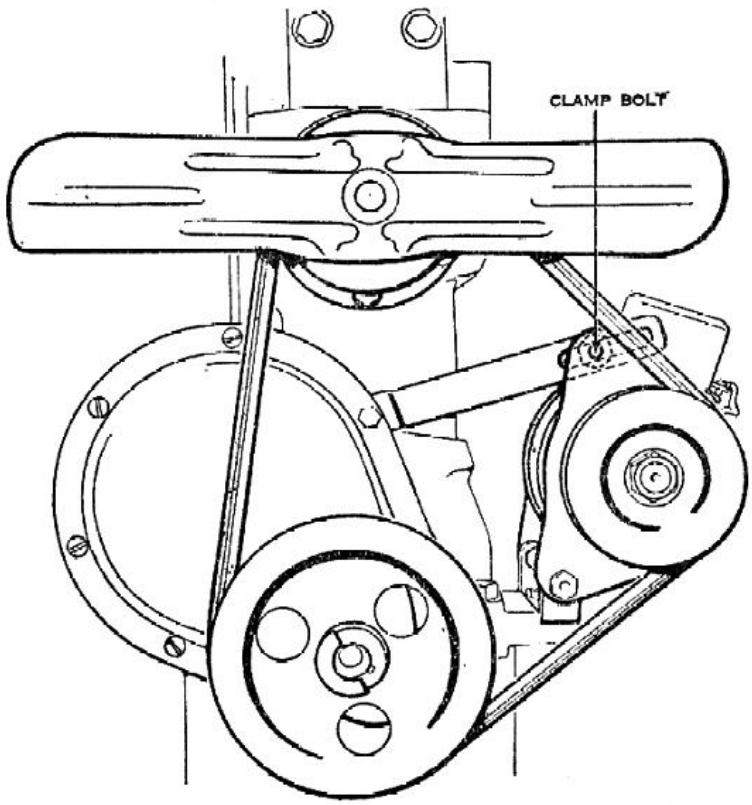


Fig. 32—Adjusting Fan and Generator Belt.

By referring to Fig. 32, the method of adjusting the belt will be made clear. All that it is necessary to do when the belt needs adjustment is to loosen the clamp screw and pull the generator outward and away from the engine slightly. Do not run with the belt too tight.

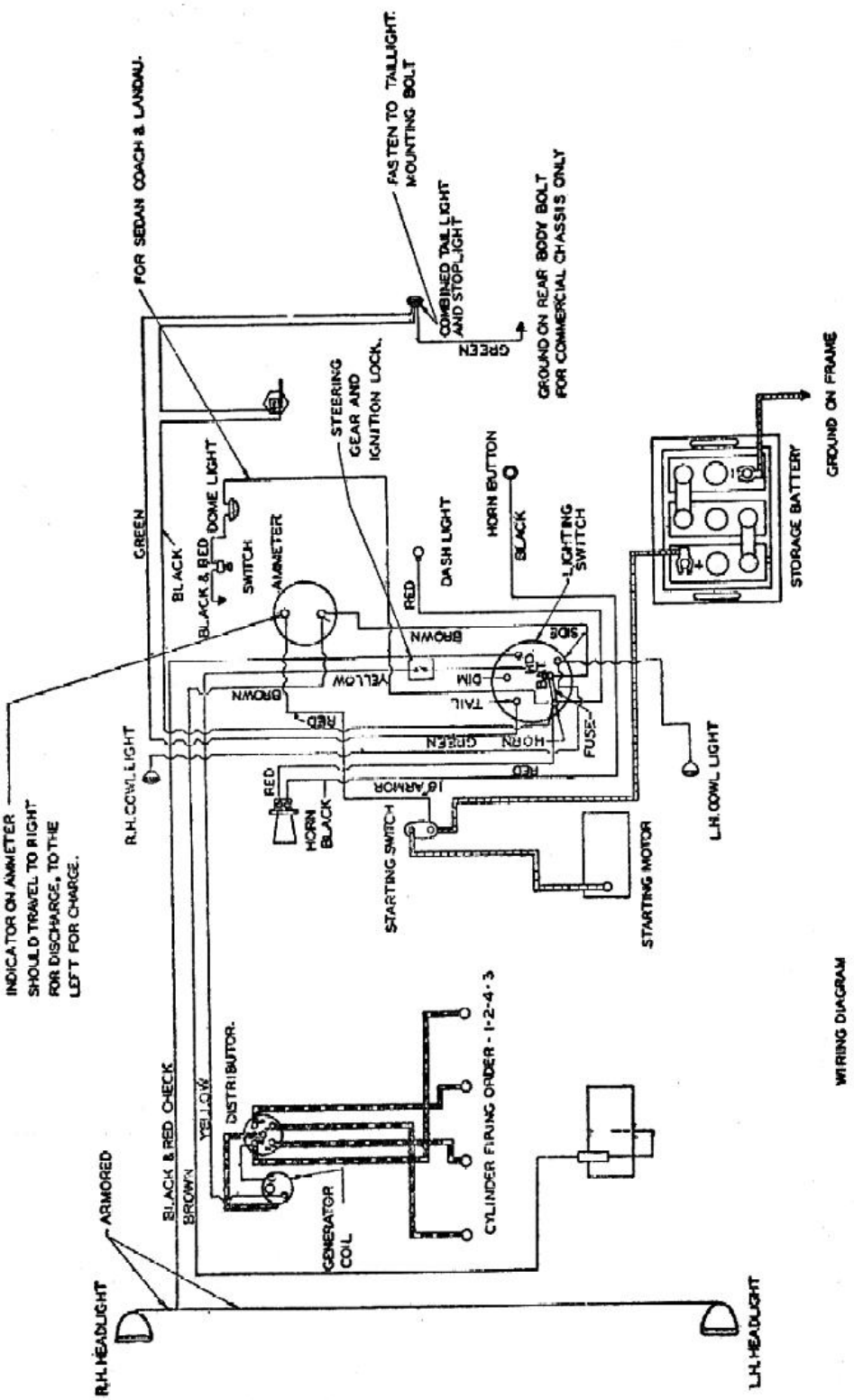


Fig. 33—Wiring diagram.

TO REPLACE FAN AND GENERATOR BELT

Loosen generator clamp bolt, see Fig. 32, and move generator toward the engine as far as it will go. Then place the belt over the pulleys, then pull the generator outward and away from the engine and tighten the clamp bolt. Do not run the engine with the fan and generator belt too tight. See that it has a small amount of "slack."

LOCATING ELECTRICAL TROUBLE

When the electrical system gives trouble, do not jump at conclusions. Only when you have made sure that the wiring is in perfect condition, all terminals tight and connected up according to the wiring diagram (Fig. 33), should trouble be looked for in the electrical instruments themselves.

SHORT CIRCUITS

A short circuit occurs when any two wires of opposite polarity come in contact at exposed places or with any metallic conductor. This will discharge the battery in a very short time, therefore, THE GREATEST CARE SHOULD BE TAKEN TO SEE THAT ALL CONNECTIONS REMAIN TIGHT AND THAT THE INSULATION OF ALL WIRES IS NOT BROKEN OR CUT.

To prevent a short circuit from damaging the wiring a fuse is inserted on the rear of the lighting switch. When this "blows" it can be easily replaced; however, before doing so be sure everything else in the wiring system is in good order.

If the ammeter hand shows a discharge when the lights are turned off and engine idle, disconnect the positive (+) wire from battery, and if the hand goes back to zero it shows that there is a leak or a short circuit, which should be remedied at once. If the hand does not go back to zero, the needle is bent.

Examine the ammeter; With the lights turned on and engine idle the ammeter hand should register "discharge." If it stands at zero, consult your Chevrolet dealer at once.

You may operate your car while the ammeter is being repaired by connecting the two ends of the wires removed from the ammeter. Be sure to thoroughly cover the connection with electrician's tape.

WINTER STORAGE OF CARS

When it is found necessary to store the car during the winter months, the car should be well lubricated, all water should be drained from the radiator and motor, after which the engine should be run under its own power until it becomes thoroughly heated. Do not run the motor too fast, but keep it going long enough to evaporate every particle of water that may be "pocketed" to prevent the water freezing and possibly bursting the water jackets.

Remove the battery and put it in storage (See Page 61).

It is desirable to remove the tires and place them in a room where they are not subjected to extreme temperature changes. The casings should be thoroughly cleaned to remove all oil which may have adhered to them. After removing the tires, thoroughly clean the inside of the wheel rims and apply a coat of shellac or enamel to prevent rust, which is very injurious to the fabric of the tire.

If the tires are not removed, jack up the car so that the wheels clear the floor at least two inches, and let the air out of the tubes.

All bright metal parts should be thoroughly coated with slab oil, vasoline, cosmic or gun grease to prevent rusting. Remove the spark plugs and place a small amount of lard oil or good cylinder oil in each cylinder and then turn the motor over once or twice by hand, so as to coat the cylinder walls thoroughly with clean oil and prevent corrosion while the car is in storage.

CARE OF TOPS

The top of the car should be thoroughly cleaned and all dust brushed out. Never attempt to clean the top or curtains with gasoline or kerosene—use a good brush or broom.

If, after exposure to the weather and after considerable use, the top material becomes checked or slightly porous allowing water to soak through, procure a good top dressing and apply it to all exposed surfaces of the top. This will not only eliminate any tendency to become damp on the under side but acts as a preservative as well.

SIDE CURTAINS

The side curtains on open cars should receive the same care as the top fabric. Do not brush the windows in the side curtains; they should be wiped with a soft cloth or washed with soap and water. The curtains should be thoroughly dried before being put away, or they will mold.

KHAKI FOR CABRIOLET

The khaki tops used on the Cabriolet may be cleaned successfully by the application of Carbona. Gasoline or other cleaning fluids which have a gasoline content will not clean this material successfully.

AUTOMATIC WINDSHIELD CLEANER

The Automatic Windshield Cleaner used on closed models is actuated by vacuum created in the intake manifold to the motor, in the same manner that the vacuum tank is operated.

The control of this instrument is located at the left end of the instrument board. To operate the Cleaner, turn the controlling valve on the instrument board to the left, thus opening the by-pass. As this opening is made larger, the speed of the Cleaner will be increased. To stop the action of the cleaner, turn the controlling valve to the right as far as it will go.

The Windshield Cleaner needs practically no attention though at long intervals it is advisable to lubricate the device by removing the two screws which attach the cover plate and by adding a few drops of 3 in 1 oil to the small moving valves while they are in motion.

A little surplus oil at this point will have no injurious effect. Oiling should be unecessary except at very rare intervals.

The only other point which need be taken into consideration aside from the adjustment of the rubber holding rod is to see that the suction line to the intake manifold on the motor does not become dented, bent or by reason of loose joints allowed to have an air leak.

In adjusting the rubber holder rod, be sure to bring the wiper in light contact with the windshield glass. Do not get too much pressure at this point.

NOTE:—You can prevent the formation of ice on the windshield glass by rubbing the glass with a piece of cloth saturated with pure glycerine. Be sure to spread the glycerine so as to form a thin film on the glass.

SUGGESTIONS FOR THE MAINTENANCE OF A BODY BY FISHER

CARE OF THE EXTERIOR

The Duco finish on a motor car possesses the merit of improving with age, at least for several months, if the car is properly cared for and not subjected, unduly, to the elements. A body painted with color varnish begins to deteriorate the day it leaves the paint shop; a "Ducoed" body actually begins to improve, to gain in luster.

In a car with this finish, Fisher counsels against the use of anything containing abrasives or alkalis. An occasional polishing with Duco Polish No. 7, or some other recognized lacquer polish (but never with furniture polish), will not materially damage the finish.

Continual polishing with unfit preparations, however, will destroy the finish. Fisher recommends the very simplest care of lacquered finish. If the car is wiped every day or at least every other day with a very soft cloth—an act which requires but a few minutes—the finish will remain lustrous without resort to expedients. The luster will not have to be "brought out" by the use of polishes; and the car will continue to look its best. When mud and sand are on the car, however, it should be thoroughly washed before wiping.

Furthermore, if the finish is cared for by being wiped at regular intervals, the car will not need to be washed except in cases where

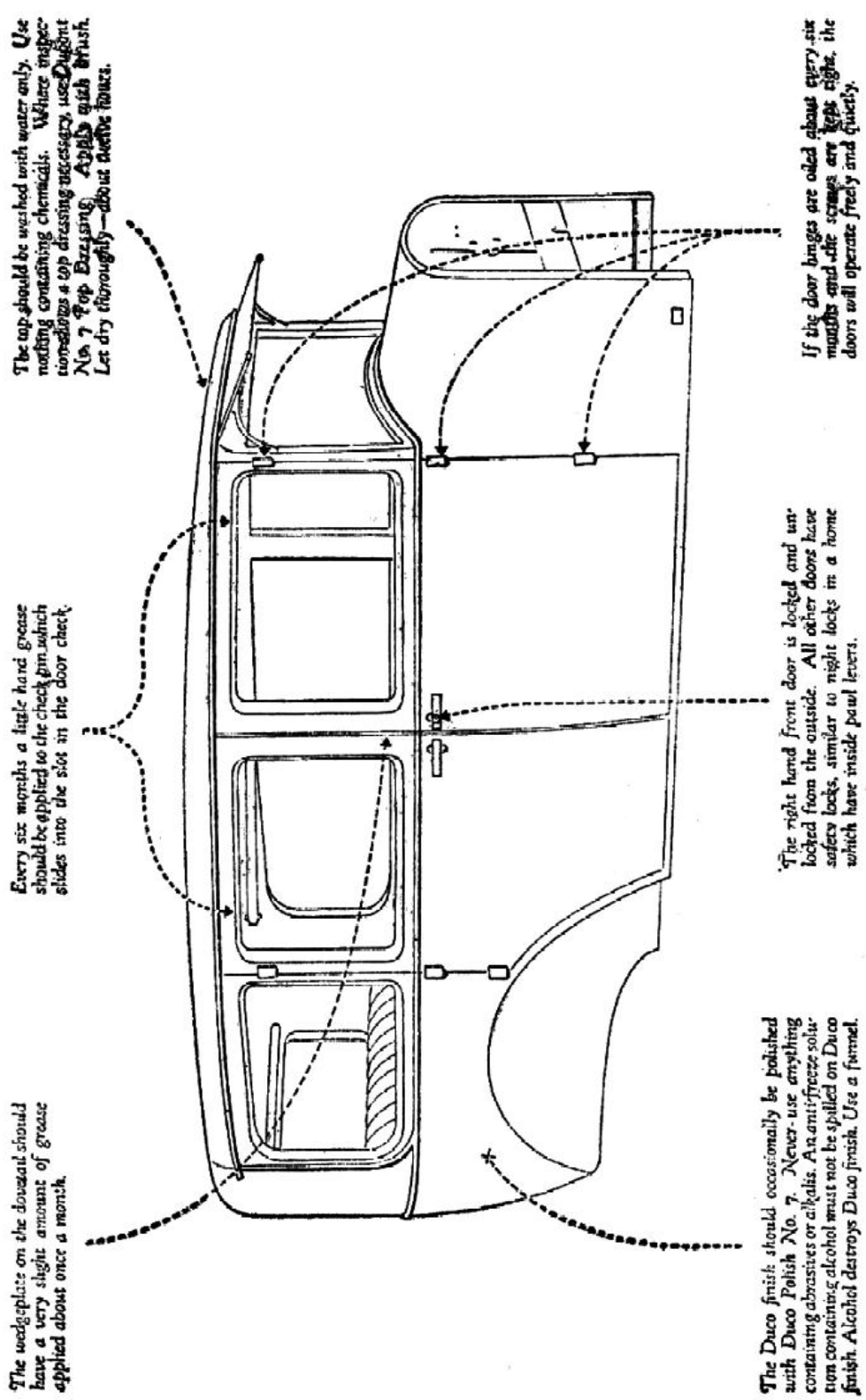


Fig. 34—Sedan Exterior

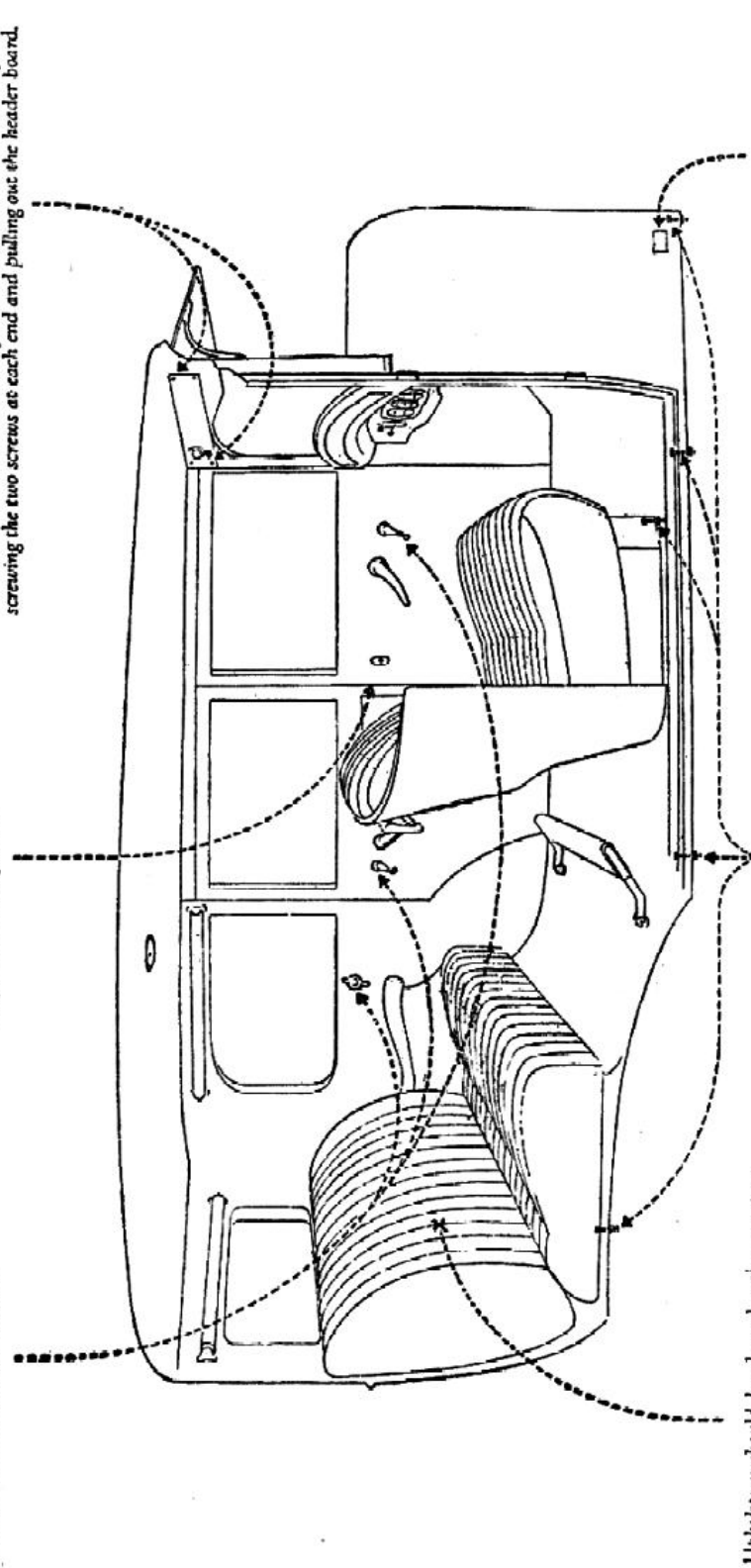


Fig. 35—Sedan Interior

through use it has accumulated an unusual amount of mud or dust. When washing is necessary, plain cold water should be used without soap.

Alcohol destroys lacquer. Therefore, if alcohol is used as an anti-freeze agent, it should be poured into the radiator with great care so that none is spilled upon any lacquered surface—such as the hood. A funnel should be used for this purpose.

CARE OF THE TOP

The top covering of the roof of your Fisher Body is subjected to the elements—heat of the sun, snow, rain, hail and dust. When inspection shows that it is necessary, it should be treated with some well-known automobile top dressing, which may be purchased in small capacity cans.

Fisher recommends for this purpose DuPont No. 7 Top Dressing. This requires ten or twelve hours to dry, as it has much greater body than the faster drying top dressings, and is far superior.

The top should be washed with **water only**—no chemicals should be used. After it has dried thoroughly, the top dressing should then be applied with a brush. This work takes but a few minutes. If the top has been subjected to unusually trying conditions, two coats of the top dressing should be applied. Many car owners, to be on the safe side, always apply two coats of top dressing, feeling that the precaution, in view of the slight effort required, is well worth while.

CLEANING THE UPHOLSTERY

Upholstery and trimming of Fisher Bodies are comparable to that which is used on the furniture in many of the finest homes. Furniture in the home, however, is protected from accumulation of dust, while the interior of your car is continuously exposed. Especially in the summer time, a car is driven day after day over all kinds of roads and subjected to greater or less continuous accumulation of dust. Therefore, the upholstery should be cleaned at least once a month with a vacuum cleaner, using the nozzle with which most vacuum cleaners are equipped. If a vacuum cleaner is not available, the upholstery should be brushed briskly with a whisk broom. It will take only a few minutes to do this, including the cleaning of the trimming on the sides and roof, and it will keep the interior of your car looking fresh and attractive.

Should the upholstery become spotted with grease, or other substances, the stains can be removed with any good cleaning fluid such as is used in removing stains from woolen or silk garments.

After the cleaning fluid has thoroughly evaporated, wet a cloth, wring and apply to the surface and press lightly with a hot flatiron, in much the same manner as a tailor presses a garment.

Steaming the fabric in this manner and rubbing lightly against the nap will raise the nap to its normal condition and will assist in restoring the texture to its original state.

Let us now go over the body of the car, explaining the more important parts, especially those that are operated for service and comfort such as doors, windows, locks and the like.

If the simple instructions given herewith are heeded and the occasional adjustments suggested are made, a Fisher Body will retain a fine appearance and will function comfortably and will reduce the likelihood of annoying rattles and squeaks.

HOW TO PREVENT SQUEAKS AND RATTLES

The body of a motor car is attached and held to the chassis by hold-down bolts. These bolts should be gone over once a month and tightened whenever necessary.

The body rests on pieces of shim or anti-squeak material, which is between the sill of the body and the top of the chassis frame. A shim is placed at each bolt.

If these bolts become loose, the body immediately starts to shift on the frame. This throws an abnormal strain on all joints, and squeaks and rattles usually result.

The majority of squeaks and rattles that develop in an enclosed body can be traced directly to loose hold-down bolts. Therefore, a few minutes devoted once a month to tightening these bolts is time well spent.

This is an essential bit of service that is frequently neglected; and yet it has an important bearing on your own comfort and motoring satisfaction. Take these precautions and the body of your car should continue to function silently and retain its newness, which will be a great advantage to you when the time comes to sell your car.

THE WINDSHIELD

The Fisher Vision and Ventilation Windshield is a Fisher contribution to greater safety and enjoyment in motoring.

With the Fisher VV Windshield, vision is unobstructed through a single pane of plate glass, without metal or rubber strips to interfere with a clear view. That means greater safety.

Superior ventilation is the second big feature. Set in felt channels, the shield can be raised vertically with one hand, while in motion, by a mechanical regulator in the same manner as the automobile windows. Air is forced into the car in two ways:

1st —Two full turns of the regulator raise the shield one inch and air enters the driving compartment through a channel extending the full width of the windshield. The air is directed downward over the front floorboard from the front of the instrument board. This cool air literally wipes all the hot air off the floor of the car. Dead air pockets or hot corners are entirely eliminated.

2nd—By raising the shield still higher, this flow of cool air is supplemented by air forced horizontally into the front compartment. Any desired degree of ventilation can be obtained.

The operating mechanism of the automatic windshield wiper is located outside the windshield, which makes its operation practically inaudible—the control button is conveniently within reach of the driver.

The VV shield is simple; it is attractive in appearance. There are no quadrants or thumb screws to work loose and cause annoyance.

The only care the ventilator needs is a small amount of hard grease placed on the bracket where the locking finger operates. This should be done about once every six months. It is necessary to remove the windshield header board to gain access to these locking fingers. It is recommended that this work be taken care of by your dealer. All other parts are self-maintaining.

WINDOW REGULATORS

The window regulators on Fisher Bodies are of a special design made in Fisher plants and are rigidly inspected several times before they are finally installed in the body. These window regulators are to raise and lower the glass with the least possible effort on the part of the operator; but it must be remembered that they can be broken or put out of order by misuse.

If the regulator is forced after the window has gone as high as it is allowed to go by the body construction, a tremendous strain is thrown on the working parts of the regulator, inasmuch as the leverage on the handle is very great. This is also true when the window is down as far as it will go. Should anything go wrong with the regulator, it is necessary to remove all the trimming on the door to make repairs. Broken glass, however, can be replaced by simply removing the garnish mouldings, putting the channel on the new glass and installing same, replacing the garnish mouldings.

While this unit is as strong as it is possible to make it in the limited space allowed for its operation, it is not indestructible. With proper usage, however, permanent satisfaction is assured.

DOOR LOCKS

The door locks are manufactured in Fisher plants from the best material obtainable, according to designs controlled by Fisher.

The only care that the door locks need is a little oil put on the lock bolt once every few months. After applying the oil, work the lock bolt back and forth so that the oil will work itself into the lock. Then the oil should be wiped off the outside so there will be no danger of staining one's clothes.

When ordering door lock keys, specify lock number, which may be found by removing the lock barrel, which is held in place by a pin.

DOOR CHECKS

Door checks on Fisher Bodies are placed at the top of the door. The check pin sliding into the slot should have a small amount of

hard grease applied about once in six months. In this way you will eliminate all binding or squeaks which are likely to develop if lubrication is neglected.

DOOR HINGES

The door hinges will not need any special attention other than to keep the screws tight and to drive in the pins, in case they become loose. However, it is advisable to put oil on these hinges about once every six months, or upon the first indication of the door not operating freely. The frequency of lubrication depends upon the car's usage and the number of times it is washed.

DOOR DOVETAIL BUMPER ASSEMBLY

The wedge plate on the dovetail should have a very slight amount of grease applied about once a month. This keeps the door working freely; inasmuch as this plunger wedges between two plates and pressure is very high at this point. Should the doors begin to stick, a very slight amount of grease will remedy the condition.

SAFETY LOCKS

Every closed body by Fisher is equipped with safety locks which operate on the same principle as the night lock on the door of a house. These locks—which are on the left-hand door of the two-door cars and on all excepting the front right-hand door on the four-door cars—have an inside pawl lever. This pawl lever may be tripped so that the door will lock, or remain unlocked. This feature makes it possible for the driver to automatically lock all his doors, excepting the one door which is equipped with an outside lock which operates with a key.

When the door is fully locked, it is necessary to use the key in order to gain entrance to the car. This feature, with the safety locks and the positive locking windshield, makes the car with a Fisher Body as nearly thief proof as an automobile body can be made. There are 250 key changes to a single model and one would have to look a long time before finding a car that would fit any particular key. Always remember, therefore, to have your door key on your key ring. Unless you have it, you may have to break into the car by force or call up the service for a duplicate key. These locks are not mastered; therefore the Service Station cannot assist you by supplying a master key.

For this reason, too, keys must be ordered by key number.

THE MEANING OF "BODY BY FISHER"

Fisher Bodies are built with the utmost care and have the advantages of the resources and experience of the largest body-building organization in the world. This organization has made more contributions to the advancement of body designing, building and equipment than any other.

Nothing is more characteristic of the manufacturing policies that govern the production of Fisher Bodies than the rigid system of inspection employed. Each and every part is inspected by experts trained in one line only. At the final assembly there is a final inspection and the body is not passed until it is found to be perfect in every detail.

Then, and then only, the symbol "Body by Fisher" is attached to the exterior at the lower right-hand corner. This symbol is your guarantee that everything that care, experience and fine workmanship can do has been done to give you the best motor car body that can be produced, at economies in production which assure maximum value.

HEADLIGHTS

The Chevrolet National car is equipped with special headlamp reflectors which when properly installed and adjusted are approved by all state authorities.

Refer to Fig. 36 and make sure that the stripes or cylindrical zones are vertical and that the word "bottom" on the reflector is at the lower center position.

For best results with the special reflectors used on Chevrolet cars, use only 21 candle power tipless precision type bulbs such as is shown in Fig. 37. We do not recommend any other type.

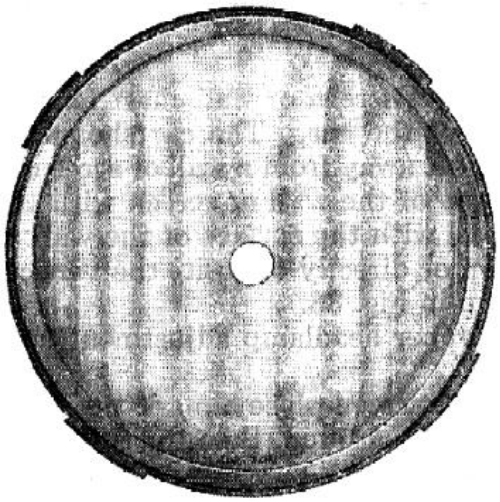


Fig. 36

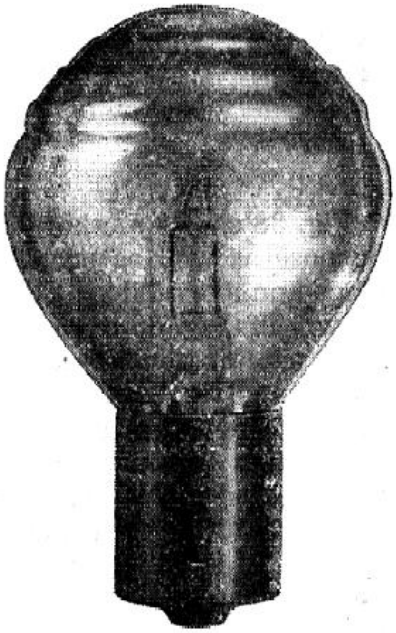


Fig. 37

A great deal of the criticism as to headlight conditions may be traced directly to improper adjustment of the headlight equipment.

All lighting devices used on cars at the present time require adjustments of some sort before satisfactory results can be obtained.

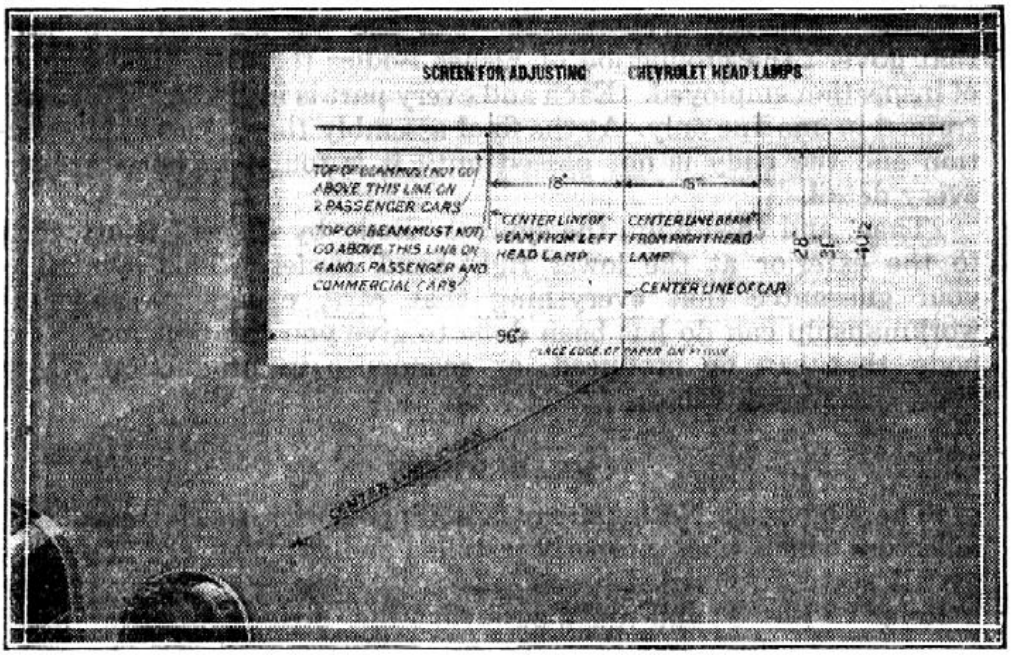


Fig. 38

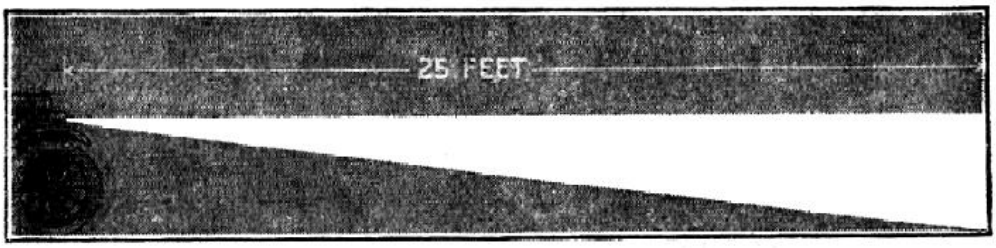


Fig. 39

Fig. 38 shows method of preparing a screen or wall chart for this purpose as well as proper placing of the car. The car should be placed on a level floor twenty-five feet away from a wall or screen as shown in Fig. 39, directly in front of the wall or screen with the front axle of the car exactly parallel with the surface of the wall or screen and the center of the car on or directly opposite the vertical line on the wall or screen as shown in Fig. 38.

A screen or chart for checking proper headlamp adjustment may be prepared as follows:

On a suitable wall space or a white screen place a mark the exact height of the headlamp center from the ground, then for the maximum height of the headlamp beam from a 2-passenger car, draw a horizontal line 5″ below this mark. For a 5-passenger car draw a horizontal line 8″ below this mark. Next draw a vertical line in the center of the screen to correspond with the center of the car, then place two vertical lines on the screen on either side of the first vertical line, their distance apart being the same as the distance between the centers of the lamps (i.e. 36″). In all adjustments

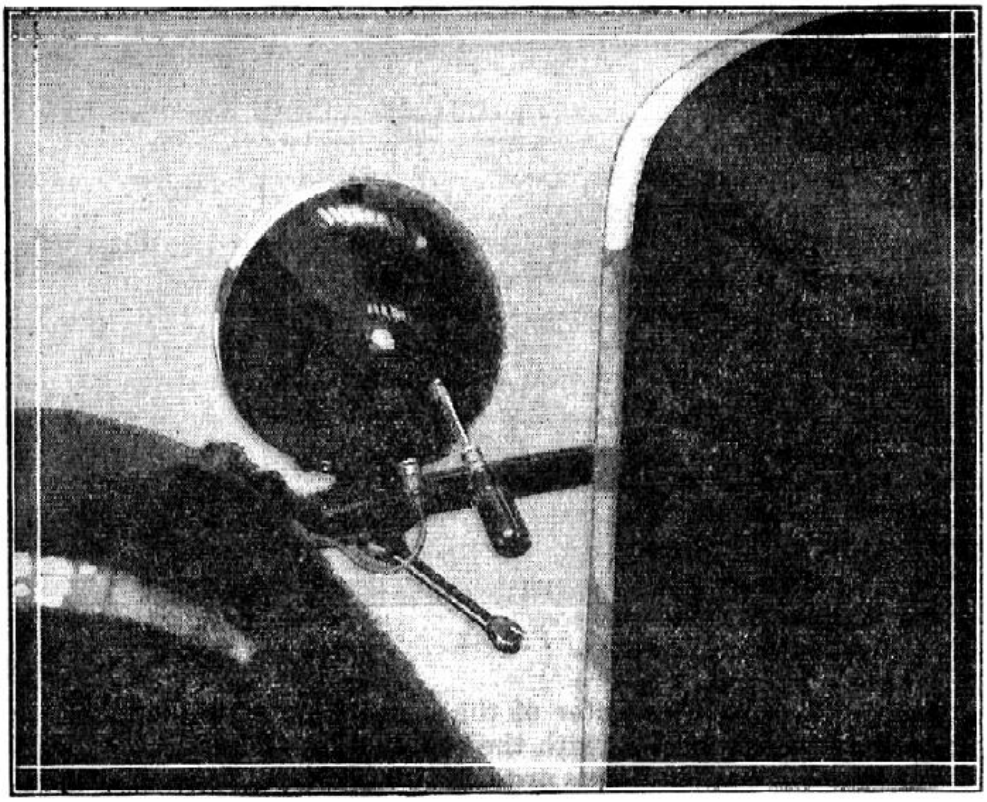


Fig. 40

it is necessary to bring the top of the beam of light to the horizontal line corresponding to the kind of car on which the adjustment is being made. Adjust one lamp at a time, keeping the other lamp

Fig. 41

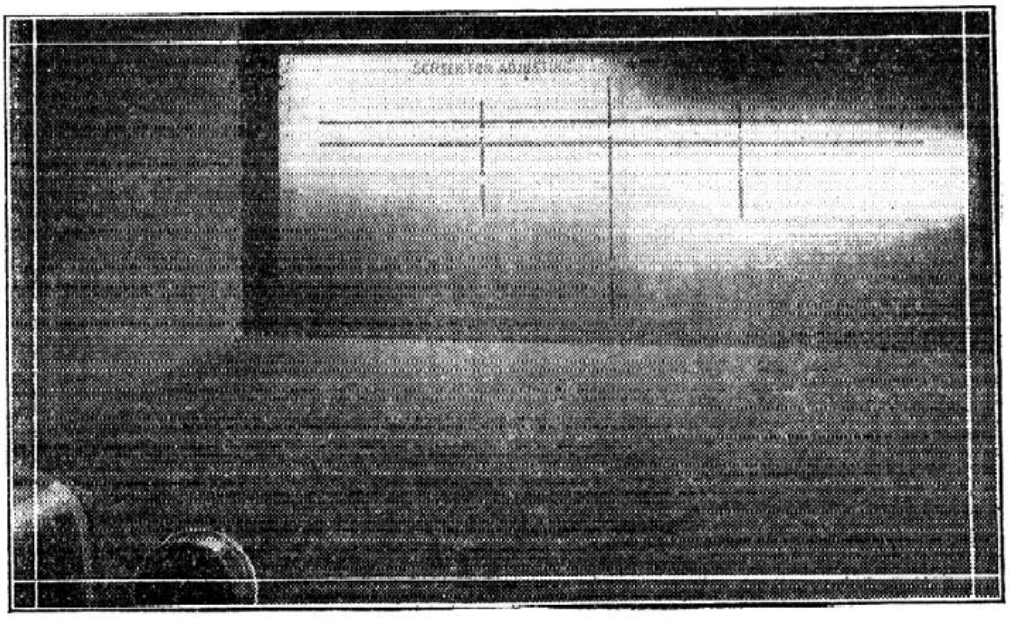


Fig. 42

covered, and bring the center of the beam from each lamp to the vertical line corresponding with the center of the lamp.

There are two adjustments provided on the headlamps. The body of the lamp may be tilted up or down or to the right or left by loosening the headlamp clamping bolt with a wrench as shown in Fig. 40.

The bulb itself may be pushed away from the reflector or backward toward the reflector by turning the focusing screw, shown in

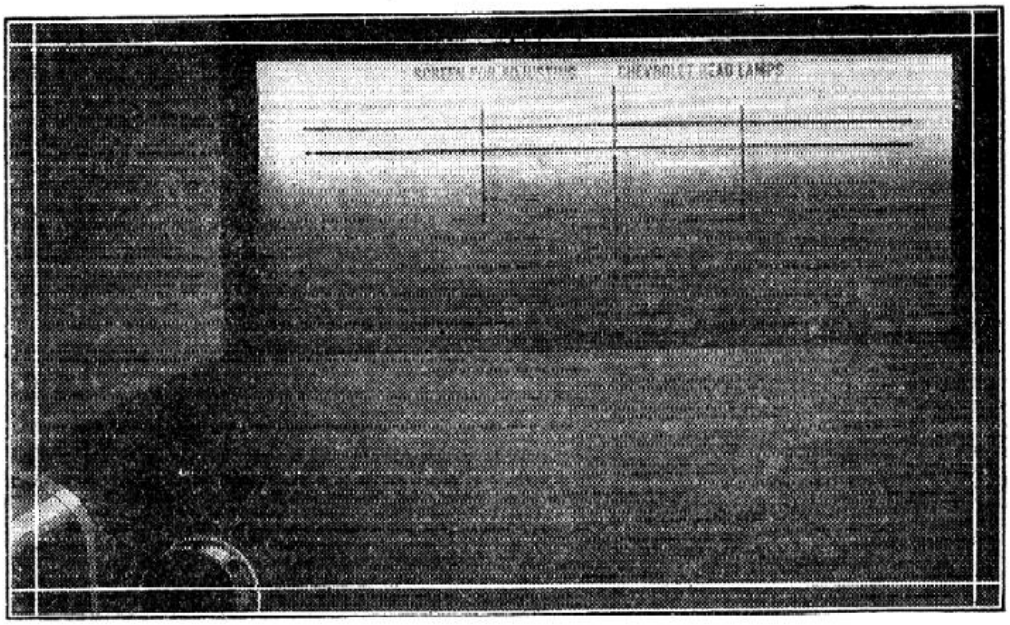


Fig. 43

Fig. 35, either to the left or right as may be required. By using this adjustment after the reflector and lens are in place, the beam of light should be brought to a narrow sharp ribbon or band of light on the screen after which the headlamp should be tilted up or down until the beam of light is below the proper line on the screen or wall.

Fig. 41 reproduced from an actual photograph shows a satisfactory adjustment. The beam of light is not too high and will not interfere with the driver of an approaching car.

Fig. 42 shows a wrong adjustment with one lamp in focus, the other lamp badly out of focus and too high. See Fig. 41 for appearance of beam when lamps are properly adjusted.

Fig. 43 shows lamps in proper focus but tilted too high. Refer to Fig. 40 and Fig. 41 where the method of adjusting the lamps as well as the appearance of a properly focused beam are shown. Be sure that the beam of light from each lamp is at the right height and is centered properly.

Consult your dealer or police department as to what the requirements are in your particular locality and have your headlamps adjusted accordingly.

STOP AND TAIL LIGHT

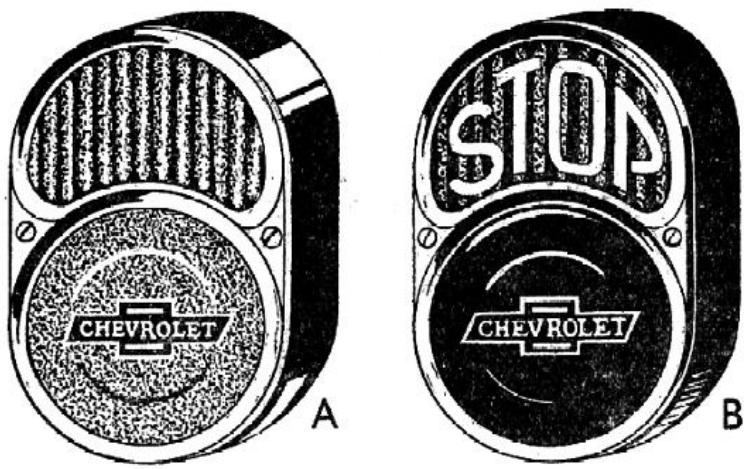


Fig. 44—Stop Light

All Chevrolet cars are equipped with a combination stop and tail lamp, Fig. 44. The stop and tail lamp is built in a unit containing two bulbs. The stop light is a single contact six-volt, fifteen candle power bulb, while the tail light is a single contact six-volt, three candle power bulb.

Drawing "A" indicates approximately the appearance of the combination stop and tail light when neither bulb is lighted, while drawing "B" indicates the approximate appearance of the combination stop and tail light when both bulbs are lighted. When the tail light is on and the stop light is off; that is, while the car is in motion,

the word "stop" will not appear on the glass but as soon as the brake pedal is pressed forward slightly, the word "stop" will flash and stay lighted until the pressure is released on the brake.

Refer to Fig. 45 for detail wiring diagram. Adjust switch operating lever on service brake rod so that switch will make contact just as the brake begins to engage.

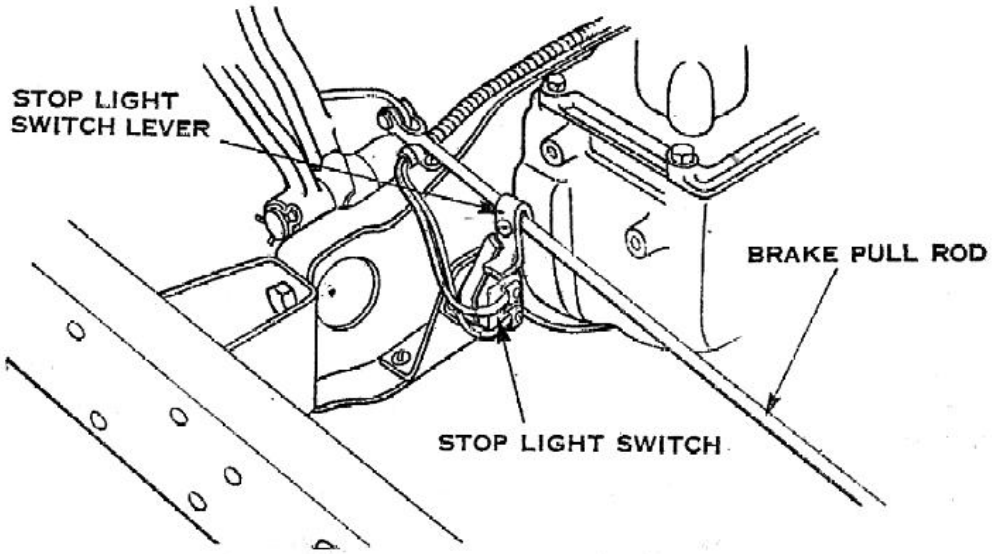


Fig. 45—Stop Light Switch

The stop light switch, Fig. 45, is entirely self contained and will be serviced as a unit only. The switch operating lever which attaches to the brake rod is sold separately.

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